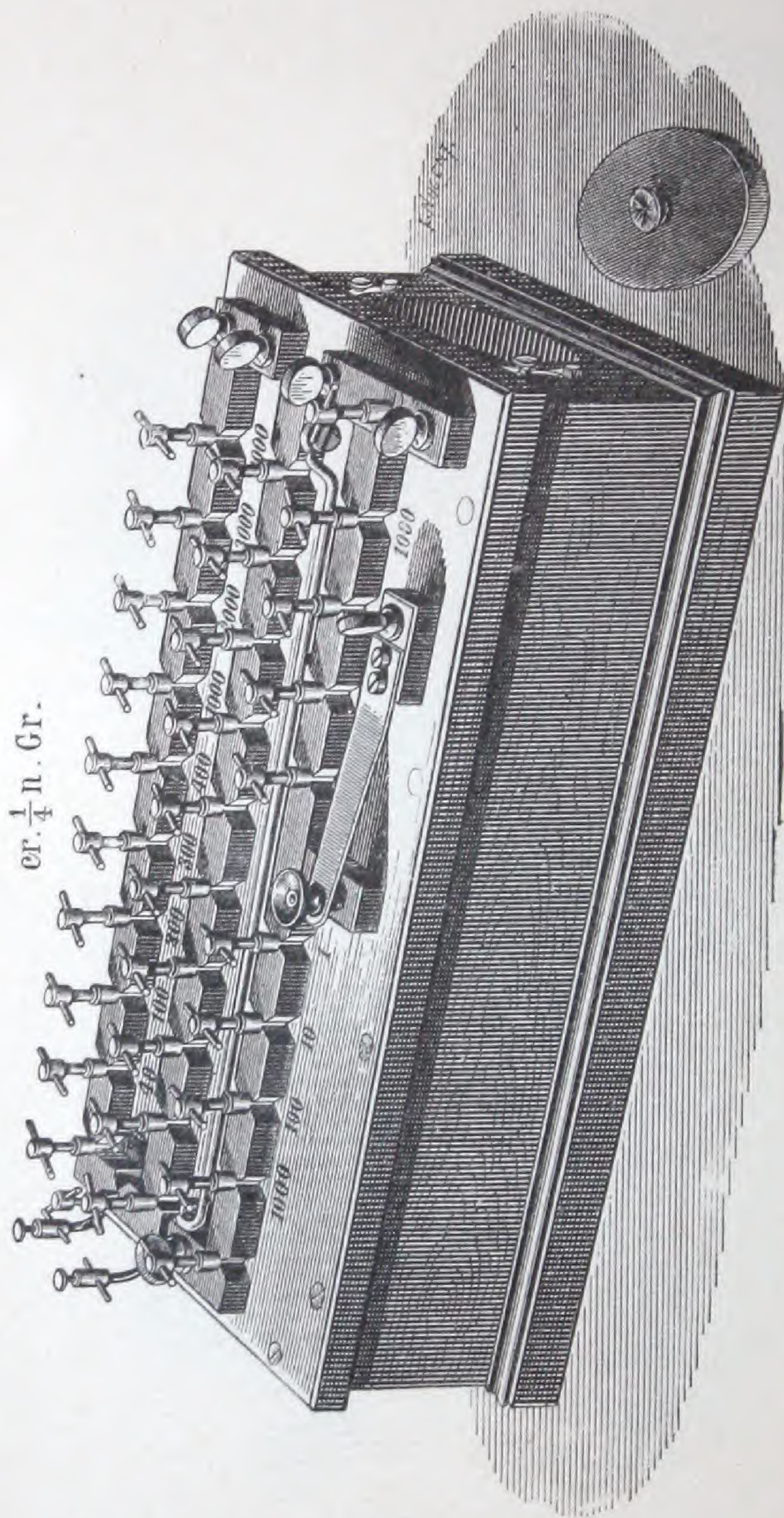


HARTMAN & BRAUN'S RHEOSTATS.

Graduated in new ohms, of excellent construction, with arrangement for attaching bridge No. 403; in series of 0.01; 0.1; 0.2; 0.3; 0.4; 1; 2; 3; 4; 10; 20; 30; 40; 100; 200 new ohms and so on.

No. 394.	Rheostat,	111.11	ohms resistance	.....	\$55 00
" 395.	"	211.11	" "	.....	60 00
" 396.	"	411.11	" "	.....	68 00
" 397.	"	711.11	" "	.....	75 00
" 398.	"	1111.11	" "	.....	83 00
" 402.	"	11111.11	" "	.....	140 00



OF $\frac{1}{4}$ N. GR.

No. 407.

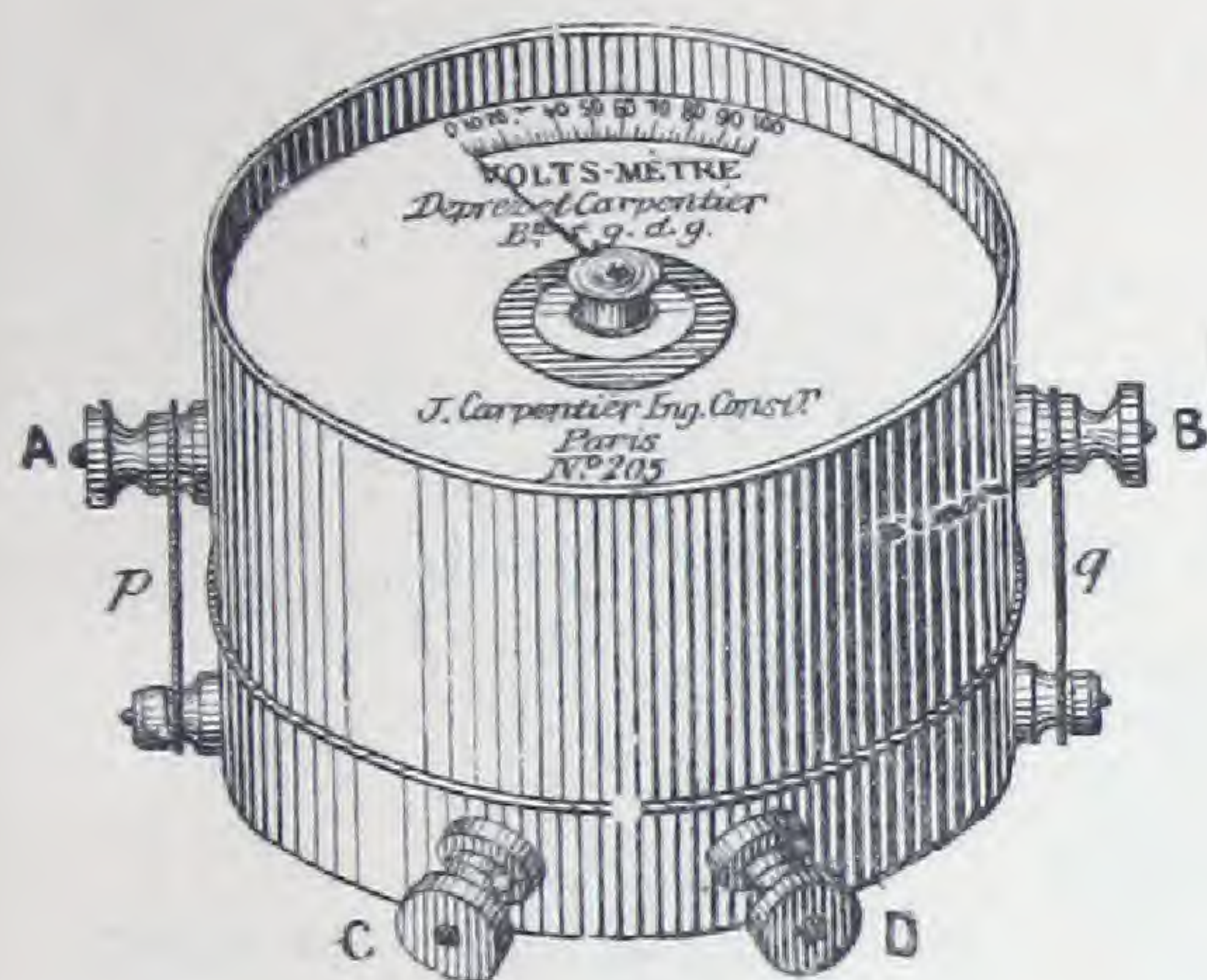
LARGE SET OF RESISTANCE COILS WITH BRIDGE.

Manufactured by Messrs. Hartman & Braun, Frankfort, Germany.

Price\$236 00

CARPENTIER AMMETERS AND VOLT-METERS.

FOR MEASURING BATTERY AND OTHER CURRENTS.



These compact instruments are well known for their constancy and reliability. They are direct reading, and are very valuable for those who have constant necessity for good measuring instruments, especially in battery work.

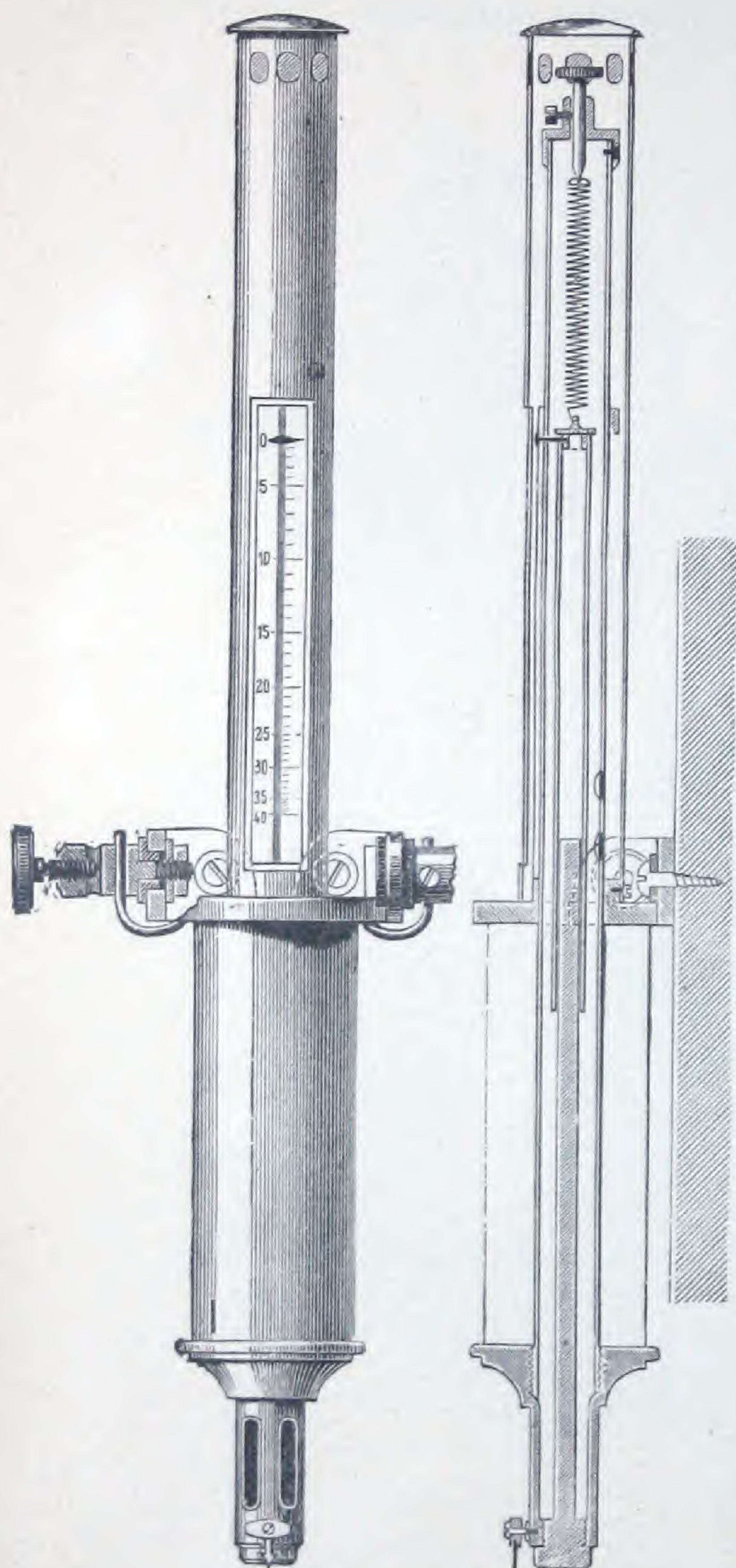
PRICES.

Carpentier Ammeter, 0-10 amperes.....	\$24 00
“ “ 0-25 “	24 00
“ “ 0-50 “	24 00
Shunt for “ 0-25 “	8 00
“ “ 0-50 “	8 00
“ “ 0-50 “	12 00
“ “ 0-50 “	16 00
Carpentier Voltmeter, 0-100 volts.....	32 00
Shunt for “ No. 1.....	12 00
“ “ No. 2.....	14 00
“ “ No. 3.....	16 00

PROF. E. KOHLRAUSCH'S AMMETERS AND VOLTMETERS.

FOR PRACTICAL PURPOSES.

To be placed on the wall; graduated in amperes and volts.



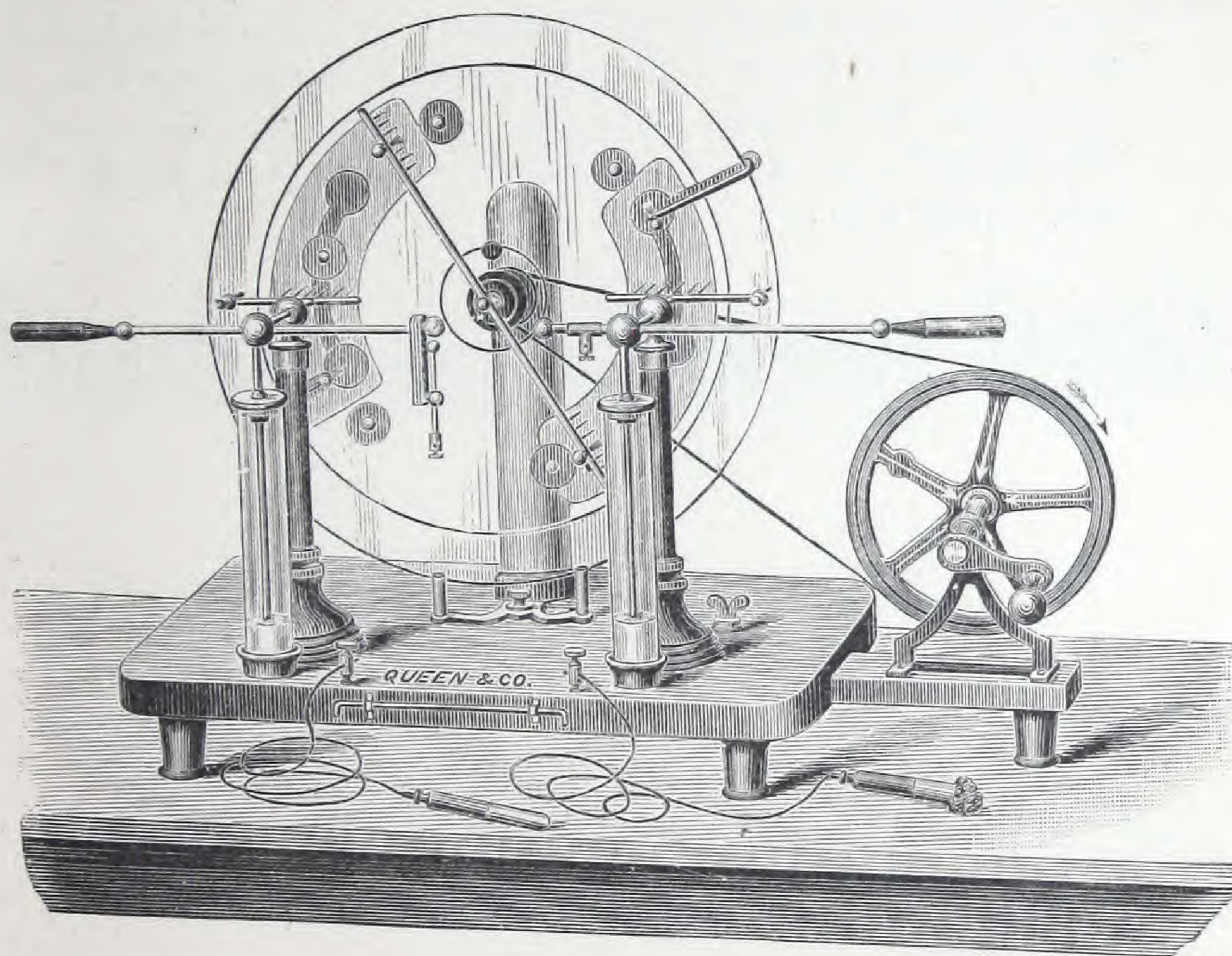
Nos. 379-383.

PRICES.

Ammeter.....	0.5-1 amperes.....	\$32 00
"	.....0.5-5	" 30 00
"	.....0-10	" 28 00
"	.....0-20	" 24 00
"	.....0-30	" 24 00
"	.....0-40	" 24 00
"	.....0-70	" 26 00
"	.....0-100	" 32 00
"	.....0-250	" 36 00
"	on tripod, 0-15	" 30 00
"	" 0-60	" 32 00
Voltmeter.....	0-60 volts.....	26 00
"	.....0-100	" 30 00
"	.....0-150	" 32 00
"	.....0-200	" 32 00
"	.....0-300	" 38 00
"	.....0-400	" 40 00

NEW AMERICAN TOEPLER HOLTZ MACHINE.

Self-Charging—Works in all Weathers—Gives Long and Brilliant Discharges.



QUEEN & CO.'S.

Approved by George F. Barker, Professor of Physics in the University of Pennsylvania; R. H. Wildberger, Professor of Natural Sciences, Kentucky Military Institute, and by other eminent authorities.

PRICE LIST.

- No. 1. Queen's New Toepler Holtz Electrical Machine.....\$25 00
- No. 2. Queen's New Toepler Holtz Electrical Machine, self-charging, more finely finished than the above, fitted with rubber supports, with neat and new arrangement for adjusting the combs, etc., to the plates, also with adjustments for the plates. Diameter of revolving plate, 31 centimeters (about 12½ inches) 50 00
- No. 3. Queen's New Toepler Holtz Electrical Machine, self-charging, finished same as No. 2, and fitted with rubber supports, with neat and new arrangement for adjusting the combs, etc., to the plates, also with adjustments for the plates. Diameter of revolving plate, 41 centimeters (about 16½ inches) 80 00
- No. 4. Queen's New Toepler Holtz Electrical Machine, self-charging, finished same as No. 2, and fitted with rubber supports, with neat and new arrangement for adjusting the combs, etc., to the plates, also with adjustments for the plates. Diameter of revolving plate, 52 centimeters (about 21 inches).....115 00

Batteries AND Miscellaneous Supplies.

BATTERIES.

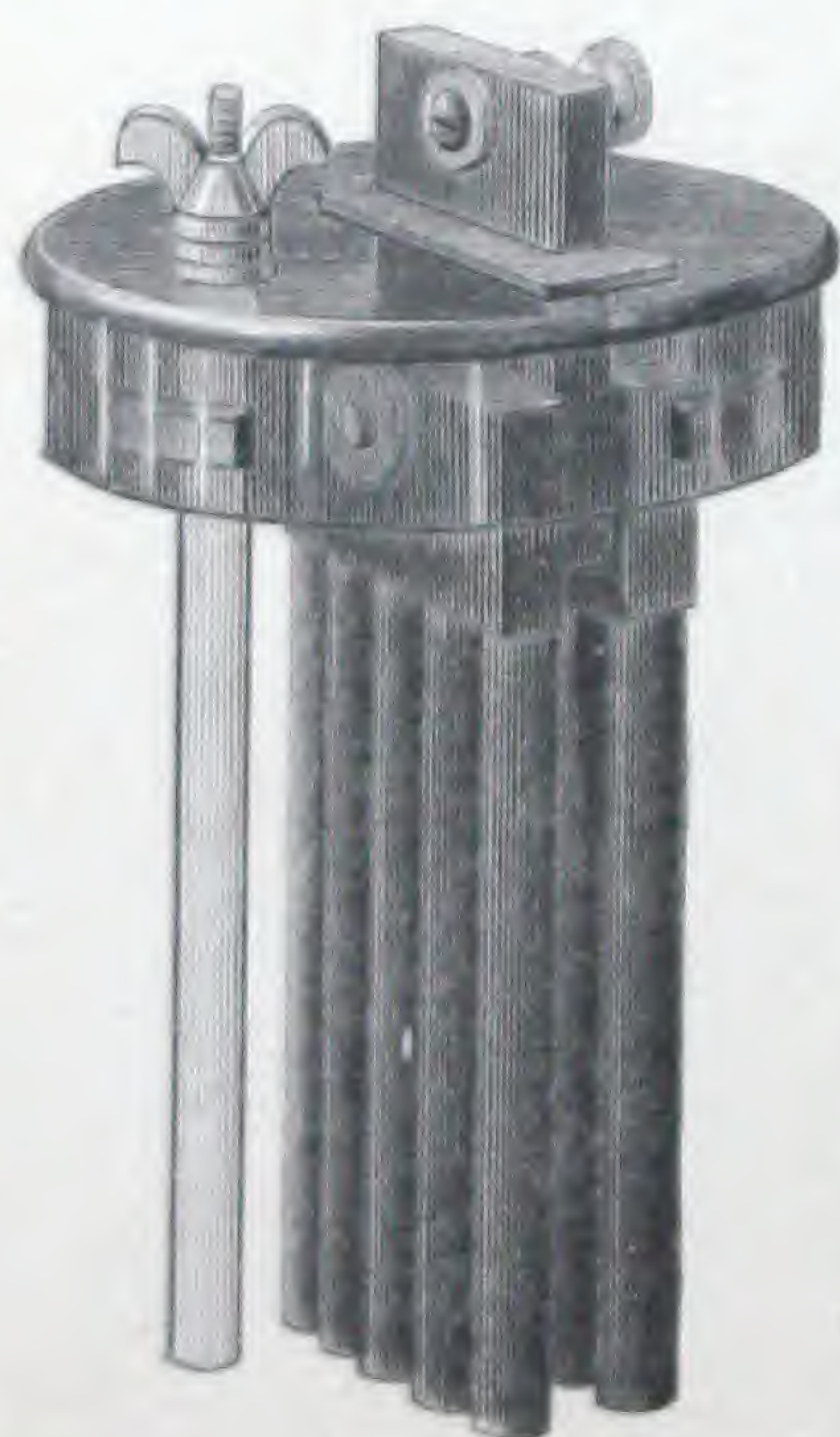
THE NEW "LAW PRISM" BATTERY.

CORRUGATED PRISMS, LOCK TOPS.

PATENTED.

For telephones, gas lighting, burglar alarms, electric clocks, annunciators, medical purposes, Morse learners, and all kinds of electric bells—Everything that can advantageously use an "Open Circuit Battery." Size over all $4\frac{1}{4} \times 4\frac{1}{4} \times 7\frac{1}{2}$.

Thousands of Cells are now in use in all parts of the land, and thousands are being added to the number monthly.



Justly celebrated throughout the United States. Hundreds of testimonials to its worth have been received.

PRICE LIST.

Complete Cell, with Sal Ammoniac.....\$1.50

Subject to Discount, for quantities only.

PARTS.

Jar and its Rubber Ring.....	\$0 30
Cover, with small Carbon sealed in.....	35
Carbon Connector.....	12
Zinc Connector.....	08
Rubber Bolt.....	12
Zinc and its Rubber Ring.....	12
Sal Ammoniac, 6 oz. in bag	08
Pairs of Prisms.....	50

THE LECLANCHÉ "DISQUE" BATTERY.

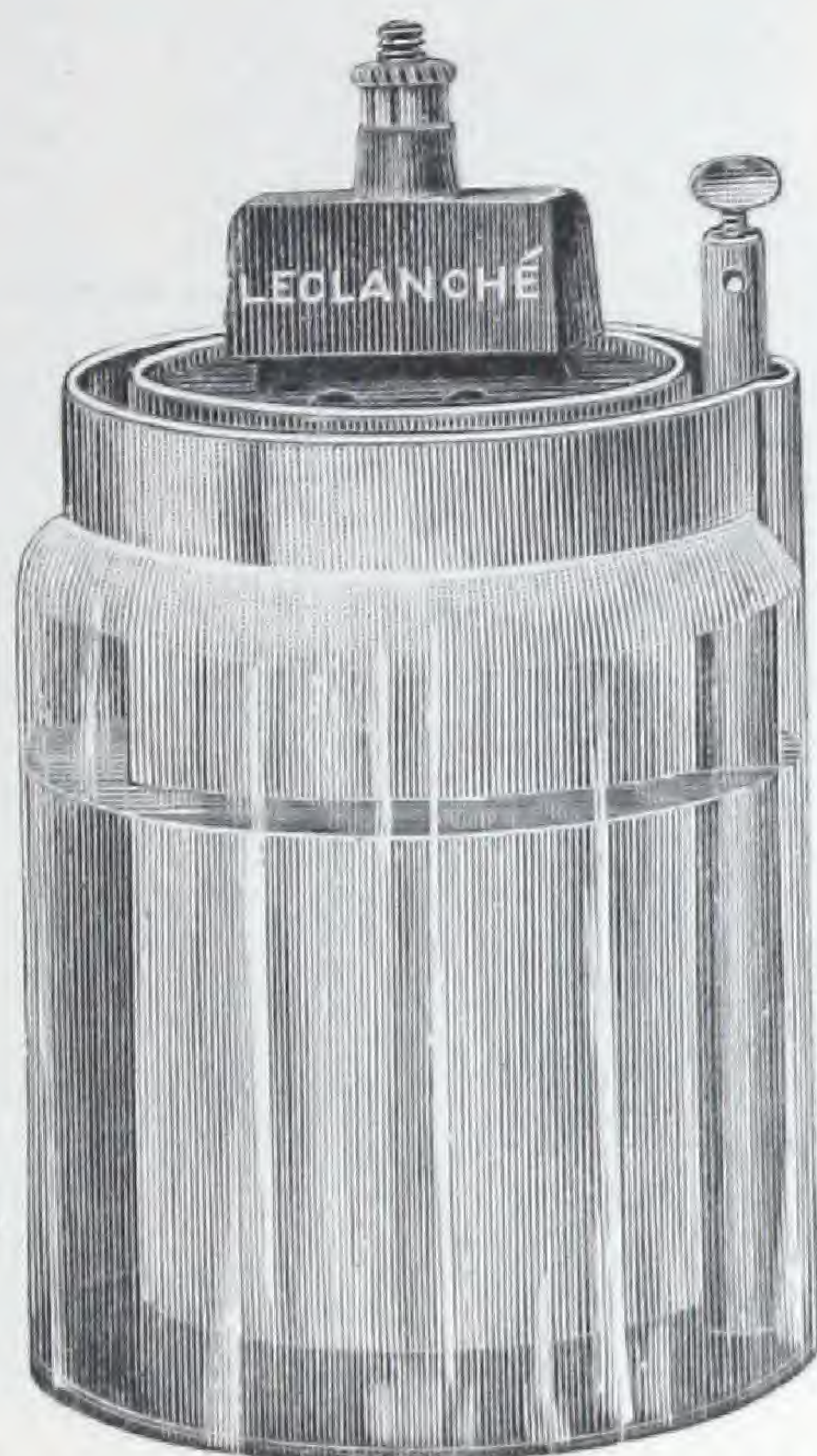
FOR ALL OPEN CIRCUIT WORK.

Telegraphs,

Telephones,

Bells,

Annunciators,



Burglar

Alarms,

Medical

Machines,

Etc., Etc.

This battery is well known throughout the world for its many good qualities. Thousands are sold every year.

PRICE LIST.

Battery, complete.....	\$1 25
Porous Cup.....	90
Glass Jar	18
Zinc, with Connector.....	10
Sal-Ammoniac.....	08

Special Discount to the Trade.

ROBERTS' PERMANGANATE BATTERY.

Patented in the United States February 3, 1885, No. 311,852; February 3, 1885, No. 311,853; May 5, 1885, No. 317,206; also in England and France.



This is a simple, easily set up and cheap battery, for open circuit work. It is put into operation by simply adding water to the powder in the cell. The battery when set up gives from 1.7 to 1.9 volts of electro-motive force, and about 2.5 *amperes*. The internal resistance is about one-half of an *ohm*. One cell will be found sufficient for ordinary bell-ringing work. It is also used for telephones, bell-ringing, gas-lighting or open circuit work generally, and can also be used for lighting incandescent lamps where only flashes for a few seconds at a time are required. There is scarcely any trouble from climbing salts, and the liquid evaporates so slowly that expensive air-tight covers are not necessary.

PRICE LIST.

Price\$1 00 per cell.

PRICES OF PARTS OF PERMANGANATE BATTERY.

Glass Jars.....	\$0 30
Zincs.....	10
Carbons.....	25
Covers.....	10
Bag of Powder.....	35

Directions on each Cell.

♦ ♦ ♦

THE GRENET BATTERY.

This battery is especially adapted for experimental and illustrative purposes. It occupies but little space, furnishes a large quantity of current, is beautiful in design, and, as the zinc can be raised from the fluid, may be kept charged, ready for use, for several weeks, and can be set in action any time when required by simply depressing the brass rod which slides through the centre of the cover of the cell, and to which the zinc is attached.

For operating induction coils and electro-medical instruments its qualities are well known. It is also well adapted for electric lighting purposes, for doctors' and dentists' use and scientific purposes; also for charging storage purposes. Electro-motive force, a little over two volts.



PRICE LIST, GRENET BATTERY.

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Inches high	6	8	10	12	12*
Price each	\$2 00	\$3 50	\$4 50	\$5 50	\$9 00

* Has double zincs and carbons.

Extra Zincs, Nos. 1 and 2..... 20c. each.
 “ “ “ 3 and 4..... 35c. “

DIRECTIONS.

To make the solution : To three pints of cold water add five fluid ounces of sulphuric acid ; when this becomes cold, add six ounces (or as much as the solution will dissolve) of finely pulverized bi-chromate of potassa ; mix well.

To charge the battery : Pour the above solution into the glass cell until it nearly reaches the top of the spherical part ; then draw up the zinc and place the elements in the cell. The fluid should not quite touch the zinc when it is drawn up.



CARBON BATTERIES.

ELECTRO-MOTIVE FORCE, 2 VOLTS.

	4 x 4. No. 1.	4½ x 4½. No. 2.	6 x 8. No. 3.
Cell complete	\$1 35	\$1 70	\$4 25
Jar only	25	25	35
Zinc only.....	40	50	2 25
Zinc Connector	15	15	20
Porous Cups only.....	12	12	25
Carbon only	12	35	50
Carbon Connector.....	22	22	50
Carbon Clamp	10	15	25

BUNSEN BATTERY.

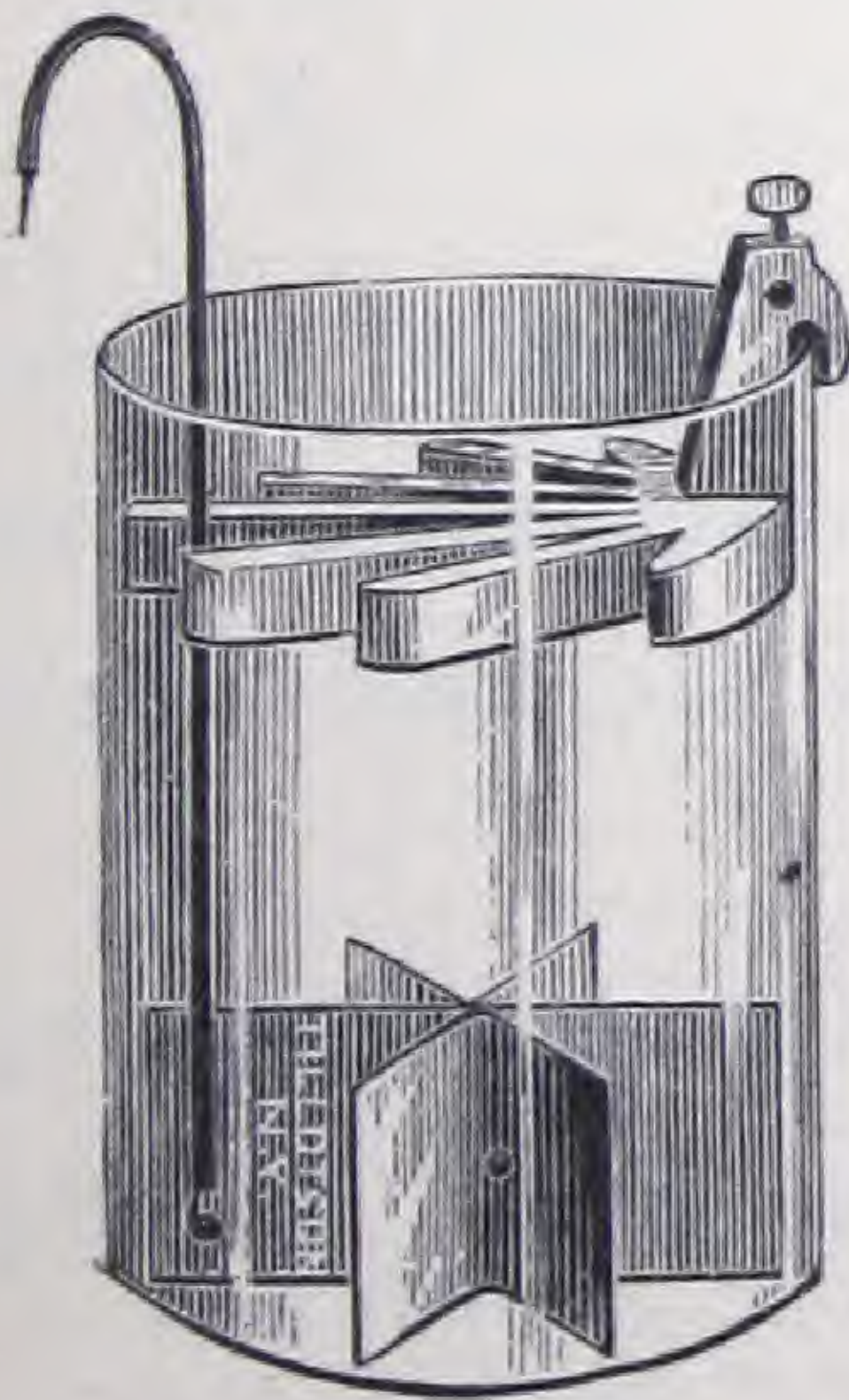
ELECTRO-MOTIVE FORCE, 1.5 VOLTS.

	HALF PINT.	ONE PINT.	ONE QUART.	TWO QUARTS.	ONE GALLON.	TWO GALLONS.
Cell complete.....	\$0 90	\$1 20	\$1 50	\$2 00	\$3 00	\$5 75
Glass Jar.....	13	20	25	30	35	75
Zinc and Connector....	30	40	60	70	1 10	1 75
Porous Cup.....	12	13	15	20	25	75
Carbon	10	12	12	35	50	1 40
Carbon Connections ...	25	40	40	45	80	1 10

GROVE BATTERY.

ELECTRO-MOTIVE FORCE, 2.1 VOLTS.

Cell complete.....	\$1 60	Jar, 4 x 4	\$0 20
Zinc.....	45	Platinum	80
Porous Cup.....	15	Platinum Standard	50



“CROW FOOT” GRAVITY BATTERY.

	MAIN. 5 x 7 INCHES.	LOCAL. 6 x 8 INCHES.
Cell, complete.....	\$0 75	\$0 90
Jar.....	25	30
Zinc, with Hanger and Connector	30	40
Copper.....	20	20

STORAGE BATTERIES.

We have four styles of secondary batteries. The sizes and prices are as follows:

SIZES AND PRICES.

STYLE.	SIZE—INCHES.	E. M. F. VOLTS.	AMPERE HOURS.	PRICE.
No. 514.	$3\frac{1}{2} \times 1\frac{3}{4} \times \frac{5}{8}$	2	1	\$4 00
“ 514 $\frac{1}{2}$.	$3\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{8}$	2	2 $\frac{1}{2}$	5 00
“ 515.	$4 \times 2\frac{3}{4} \times \frac{7}{8}$	4	1	6 00
“ 516.	$4\frac{1}{8} \times 3\frac{1}{4} \times 1\frac{1}{8}$	4	2 $\frac{1}{2}$	9 00

Styles 515 and 516 for brilliant scarf pins, bouquets, surgical and dental lamps, theatrical lamps, microscopic lamps, etc., etc.

We have the various attachments for the above-described purposes, and are prepared to furnish attachments for use with the storage batteries, as follows:

Scarf-pin lamp, connecting cord with terminal and switch	\$2 50
Hair-pin lamp, with reflector, cords and switch	3 00
Portable battery case, with lamp, reflector and switch, specially adapted for use in families and hospitals	3 50
Primary battery for re-charging	3 00

Where batteries are treated with ordinary care, that is, not subjected to rough usage, and when charged and discharged in the manner and at the rate given in the directions for use, they should do excellent work for many months.

Where the battery is used to light a scarf-pin or other lamp by flashing only at intervals, it will last a longer time at one charging than if burned continuously.

MISCELLANEOUS SUPPLIES.

HARD RUBBER,		in sheets.....	Per lb., \$1 75
"	"	in rods.....	" 2 00
RED VULCANIZED FIBRE,		in sheets, below $\frac{1}{16}$ -in. thick,	" 60
"	"	" $\frac{1}{2}$ to $\frac{7}{8}$ -in. thick.....	" 60
"	"	" $\frac{1}{16}$ to $\frac{1}{2}$ -in. thick.....	" 50
BLACK VULCANIZED FIBRE,		in sheets,	
		Below $\frac{1}{16}$ -in. thick.....	" 65
"	"	" $\frac{1}{2}$ to $\frac{7}{8}$ -in. thick.....	" 65
"	"	" $\frac{1}{16}$ to $\frac{1}{2}$ -in. thick.....	" 55
SQUARE RODS VULCANIZED FIBRE,		in random lengths,	
		$\frac{1}{4}$ to $\frac{1}{2}$ -in. square. Per lb.,	60
"	"	" $\frac{1}{2}$ to $\frac{7}{8}$ -in. square. "	70

PLATINUM WIRE.

NUMBER.	PER INCH.	NUMBER.	PER FOOT.
No. 12.....	\$0 80	No. 26.....	\$0 60
" 14.....	50	" 28.....	50
" 16.....	35	" 30.....	30
" 18.....	25	" 32.....	20
" 20.....	20	" 34.....	15
" 22.....	15	" 36.....	10
" 24.....	08	" 40.....	06

Nos. 12 to 22.....	Per dwt., \$0 60
" 24 to 30.....	" 75

PRESSED CARBONS.

FOR BATTERY AND OTHER PURPOSES.

INCHES.			PRICE EACH.	INCHES.			PRICE EACH.	INCHES.			PRICE EACH.
Long.	Wide.	Thick.		Long.	Wide.	Thick.		Long.	Wide.	Thick.	
3	2	$\frac{1}{4}$	\$0.05	9	6	$\frac{1}{8}$	\$0.30	12	6	$\frac{3}{8}$	\$0.70
$3\frac{1}{4}$	$2\frac{1}{2}$	$\frac{1}{4}$	.06	9	6	$\frac{1}{4}$	.40	12	6	$\frac{1}{2}$	.80
$4\frac{1}{4}$	$1\frac{3}{8}$	$\frac{1}{4}$	.06	9	6	$\frac{3}{8}$	.55	12	12	$\frac{1}{8}$	.90
$4\frac{3}{4}$	$1\frac{3}{8}$	$\frac{1}{4}$	.06	9	6	$\frac{1}{2}$	.65	12	12	$\frac{1}{4}$	1.00
$5\frac{3}{4}$	$1\frac{7}{8}$	$\frac{1}{4}$	.08	10	6	$\frac{1}{4}$	.40	12	12	$\frac{3}{8}$	1.15
6	$\frac{3}{4}$	$\frac{5}{8}$	.08	10	6	$\frac{3}{8}$	.55	12	12	$\frac{1}{2}$	1.40
6	$1\frac{7}{8}$	$\frac{5}{8}$	.20	10	6	$\frac{1}{2}$	.65	12	12	$\frac{5}{8}$	1.50
6	3	$\frac{1}{2}$	.25	11	6	$\frac{1}{4}$	.50	12	12	$\frac{3}{4}$	1.65
7	$1\frac{1}{2}$	$\frac{1}{4}$	.07	11	6	$\frac{3}{8}$	.60	18	12	$\frac{1}{4}$	3.00
7	$4\frac{1}{2}$	$\frac{1}{2}$	.35	11	6	$\frac{1}{2}$	.75	18	12	$\frac{1}{2}$	3.50
8	$5\frac{3}{4}$	$\frac{1}{8}$	.30	11	9	$\frac{1}{4}$	.75	18	15	$\frac{1}{4}$	3.75
8	$5\frac{3}{4}$	$\frac{1}{4}$	.35	11	9	$\frac{3}{8}$	.90	18	15	$\frac{1}{2}$	4.50
9	2	$\frac{5}{8}$	.30	11	9	$\frac{1}{2}$	1.10	18	18	$\frac{1}{4}$	4.75
9	$4\frac{1}{2}$	$\frac{1}{2}$	.40	12	6	$\frac{1}{4}$	.60	18	18	$\frac{1}{2}$	5.25

Special Sizes made at Short Notice.

Carbon Buttons, $\frac{3}{8} \times \frac{3}{16}$	Per 100, \$4 00
“ “ $\frac{11}{16} \times \frac{1}{8}$	“ 8 00



BATTERY CHEMICALS AND METALS.

ACID, SULPHURIC.....	Per lb., \$0 10
“ CHROMIC.....	Per oz., 14
BI-CHROMATE POTASH.....	Per lb., 25
BI-SULPHATE MERCURY.....	“ 1 25
MERCURY	“ 75
SULPHATE OF ZINC.....	“ 10
SAL AMMONIAC	“ 20

ZINC PLATES, best quality, cut to sizes required, 18 to 35 cents per lb.

PERMANENT MAGNETS.

HORSESHOE.



2-inch.....	\$0 10
2½ ".....	12
3 ".....	15
3½ ".....	20
4 ".....	25
5 ".....	40
6 ".....	60
7 ".....	80
8 ".....	1 10
9 ".....	1 50
10-inch.....	2 00
12 ".....	2 75
Compound, 4 Bars, 6 inches.....	6 00
" 4 " 8 ".....	8 00
" 4 " 10 ".....	15 00



MAGNETS FOR EXPERIMENTAL MAGNETO MACHINES.



4-inch.....	\$0 75
6 ".....	1 50
8 ".....	1 75
9 ".....	3 00
10 ".....	4 00

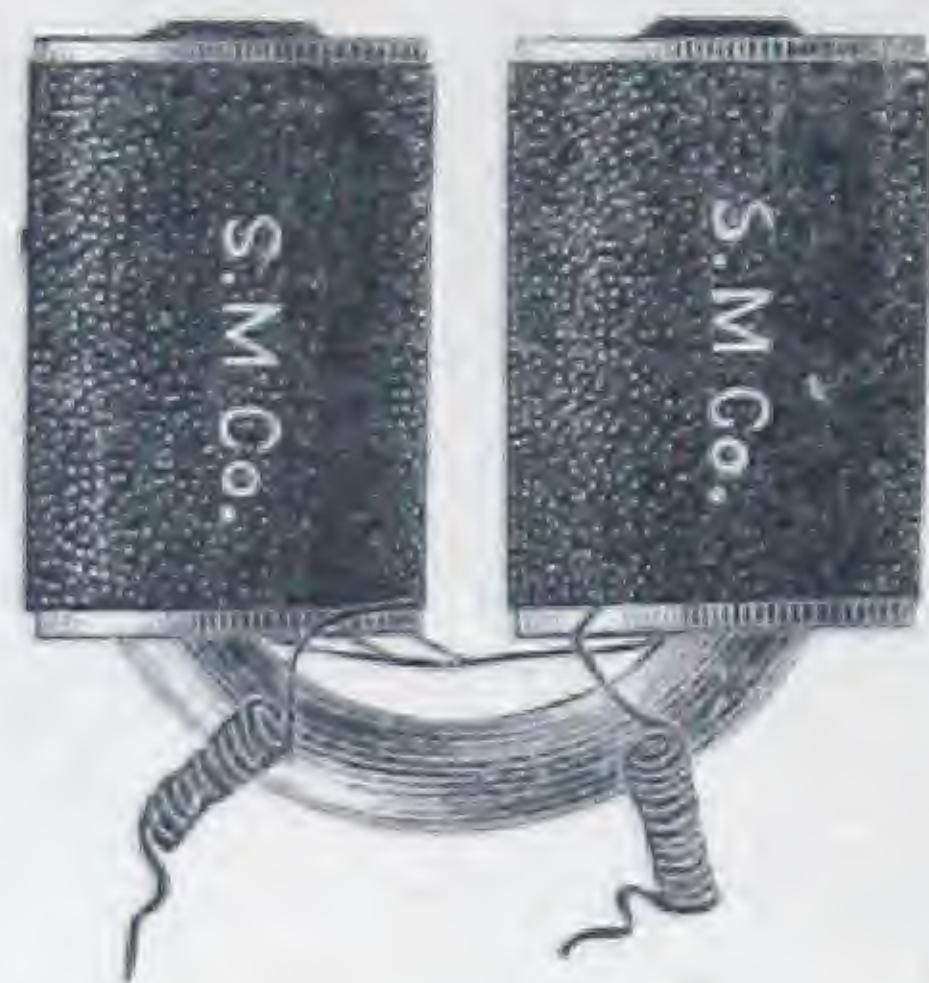
BAR MAGNETS.

WITHOUT ARMATURES.

Pol. Cast Steel Bar, ½x½x4 in.....	Per pair, \$0 30
" " ½x½x6 in.....	50
" " ½x1x8 in.....	1 00
" " ½x1½x10 in.....	1 50
Round Bar Magnets, ½ to ¾-inch diameter, 4 to 6 inches long.....	50

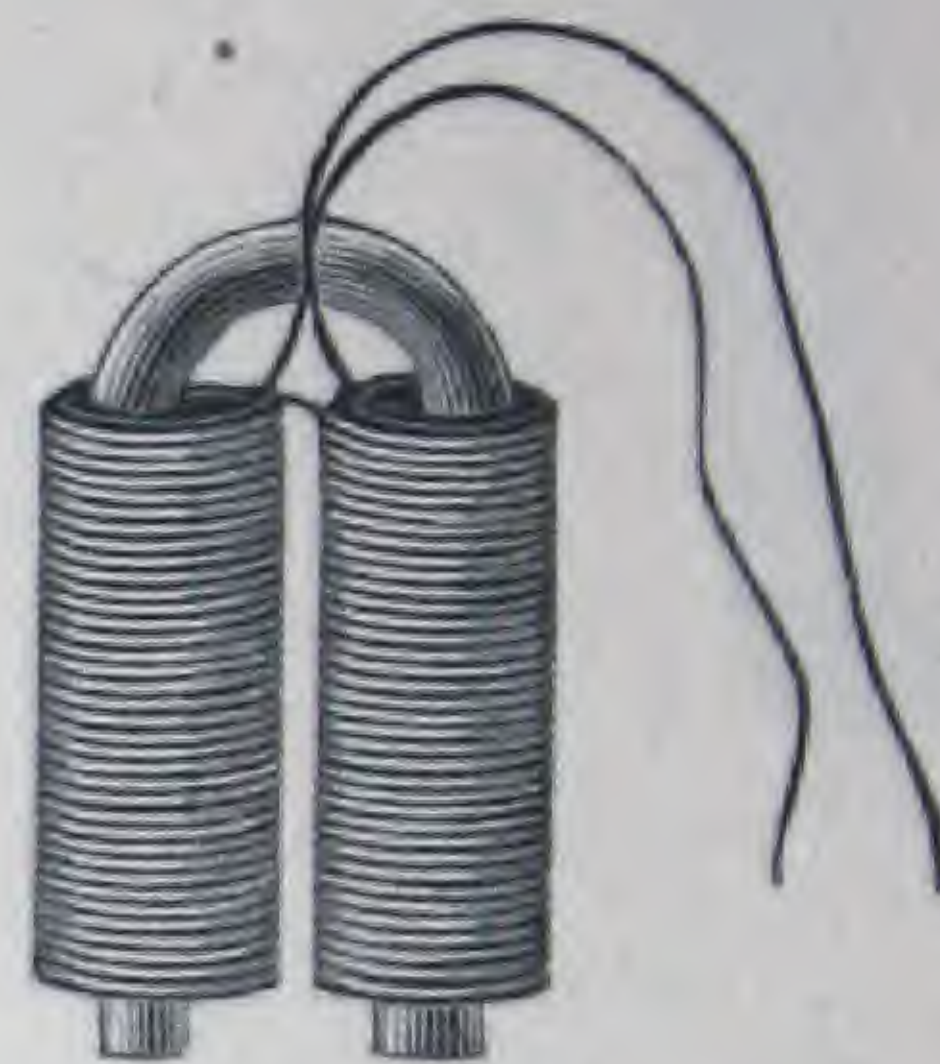
Special Magnets to Order.

ELECTRO-MAGNETS.



COMMON MAGNETS.

For Bells, Small Apparatus, etc., etc.



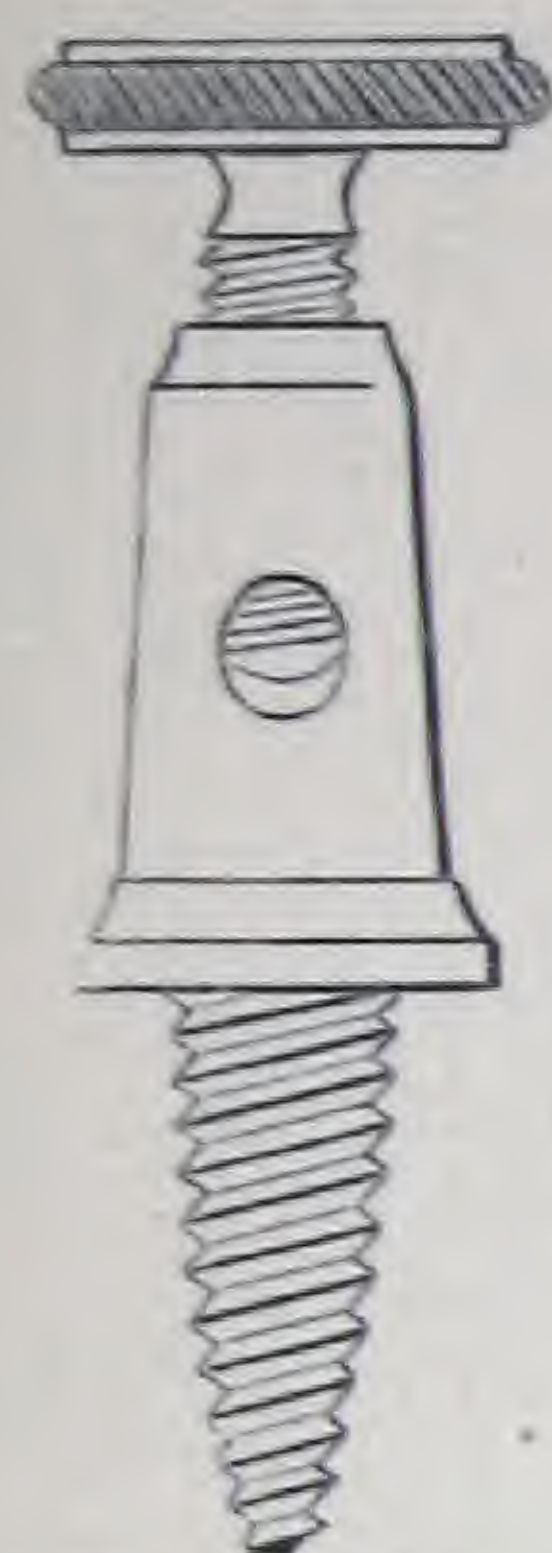
LIFTING MAGNETS.

For School Purposes, Experimental Work, etc.

Instrument, Giant Sounder Size, rubber covered.....	\$2 00
" No. 2 and 3, Pony Sounder Size.....	1 50
" No. 1, Light Relay Size, 50 to 100 ohms.....	6 00
" No. 1, Standard Relay Size, 100 to 160 ohms.....	6 50
" No. 1, Heavy Relay Size, 100 to 400 ohms.....	9 00
" Western Union Relay Size, 100 to 400 ohms.....	5 00
" Pony Relay Size, 10 to 50 ohms	2 50
" No. 1 and European Register.....	2 50
Common, 5 ohms resistance.....	0 75
" 20 ohms resistance.....	1 00
Lifting Magnets, 3-inch, sustaining about 25 lbs.....	2 00
" " 4-inch, " " 40 lbs.....	2 50
" " 5-inch, " " 60 lbs.....	3 00
" " 6-inch, " " 120 lbs.....	4 00

Any Size or Style to Order.

BINDING POSTS AND CONNECTORS.



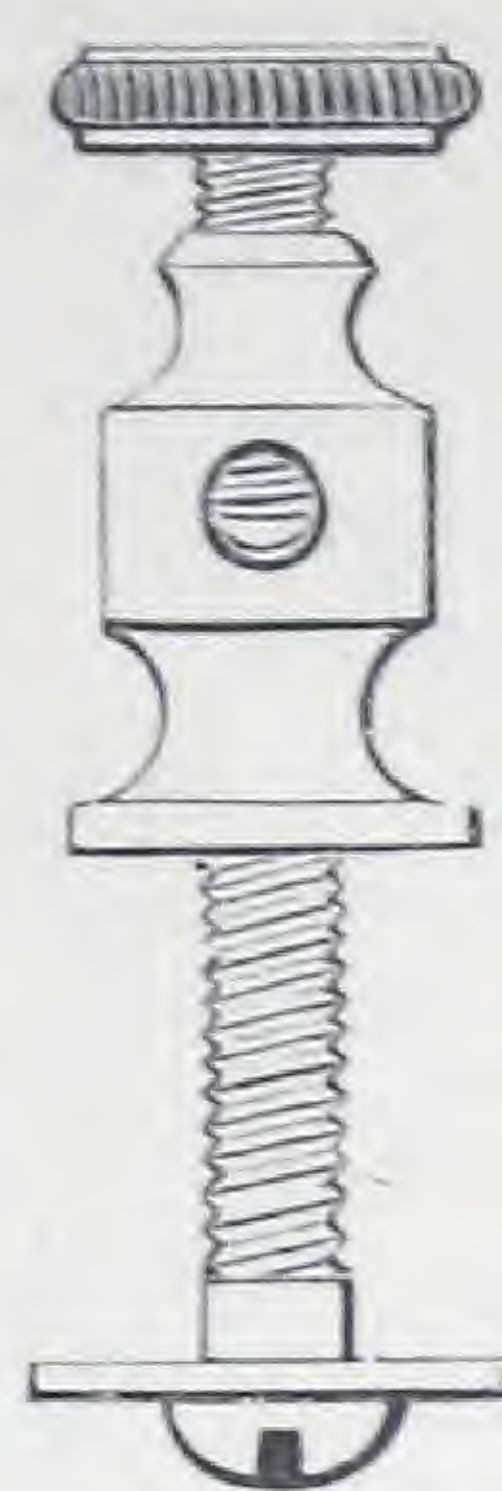
No. 1, 15c.



No. 2, 15c.



No. 3, 15c.



No. 4, 12c.



No. 5, 11c.



No. 6, 10c.

Special Prices per 100.



No. 7, 10c.



No. 8, 9c.

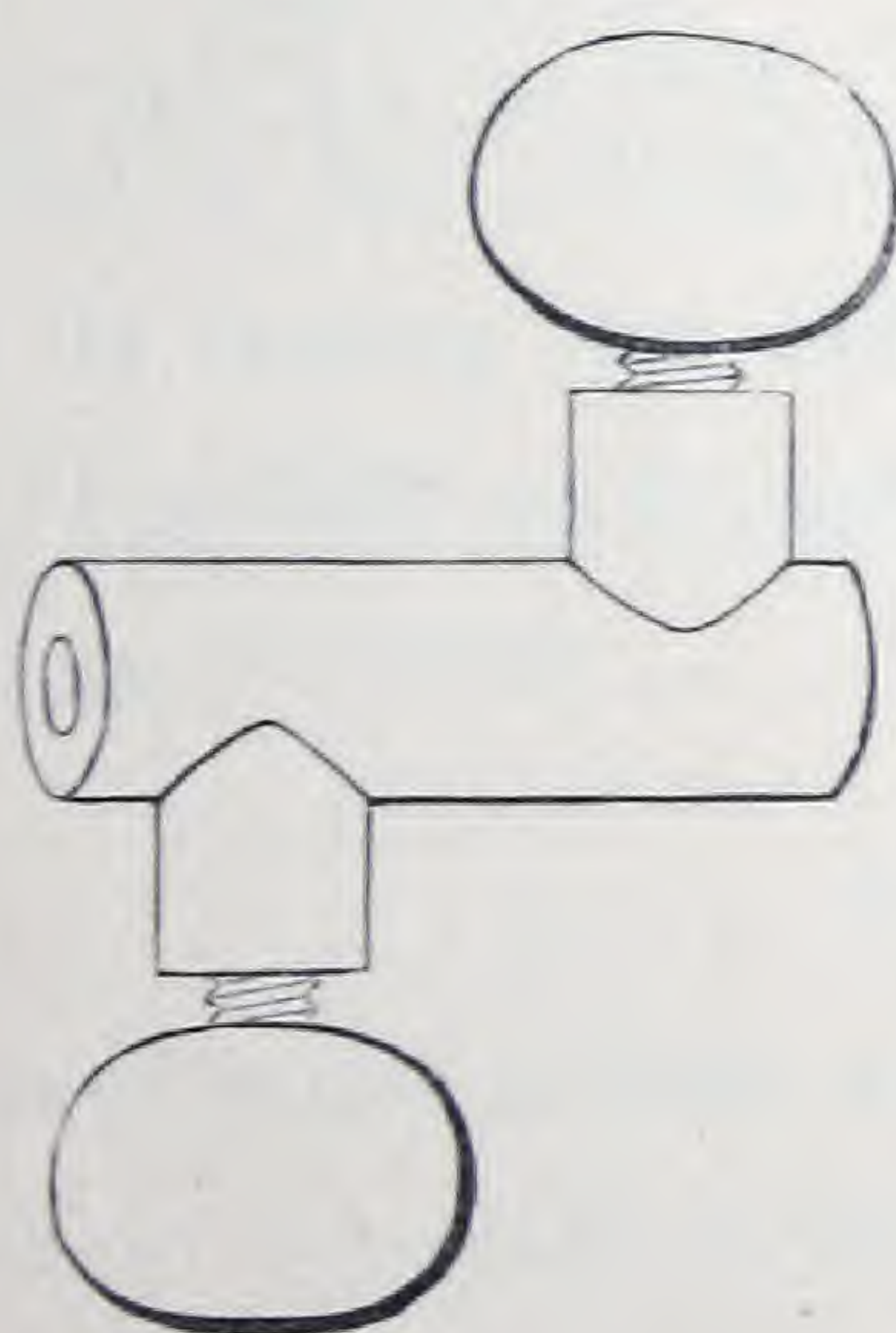


No. 9, 10c.

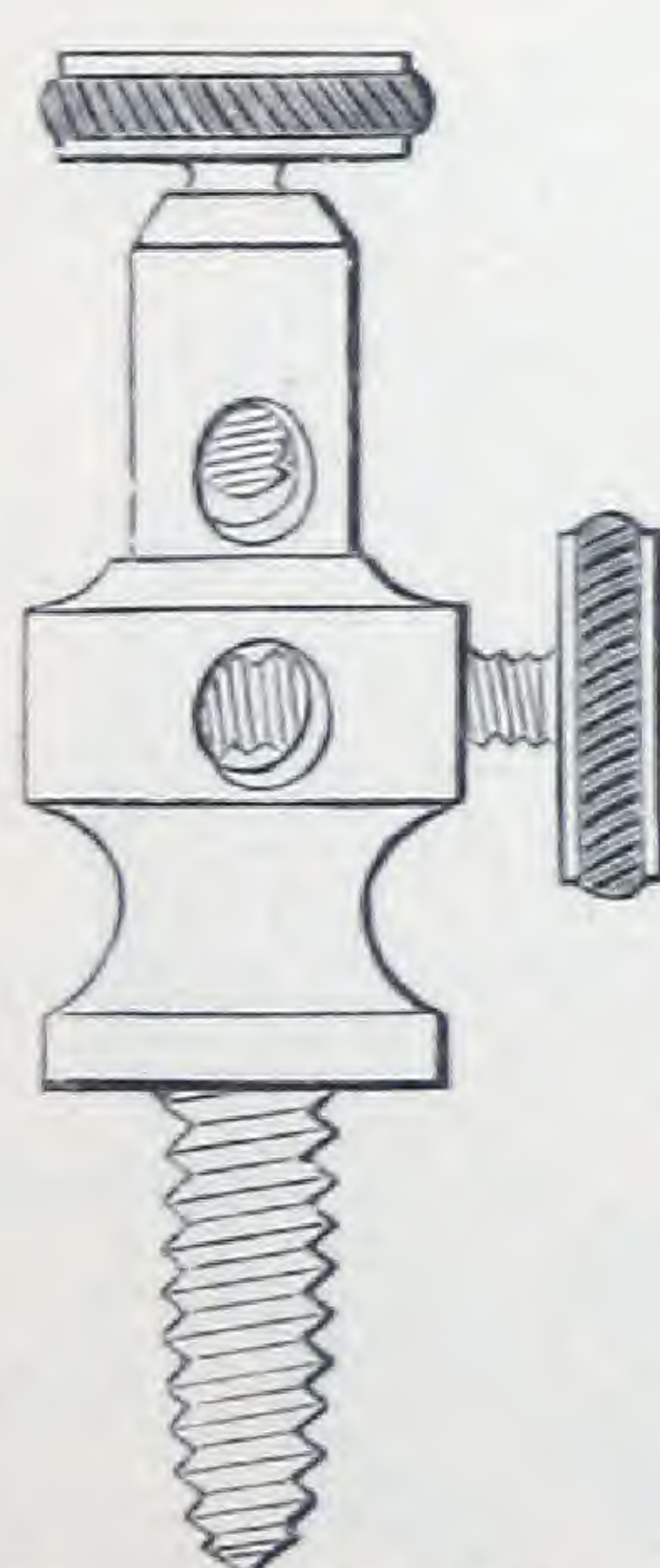


No. 10, 8c.

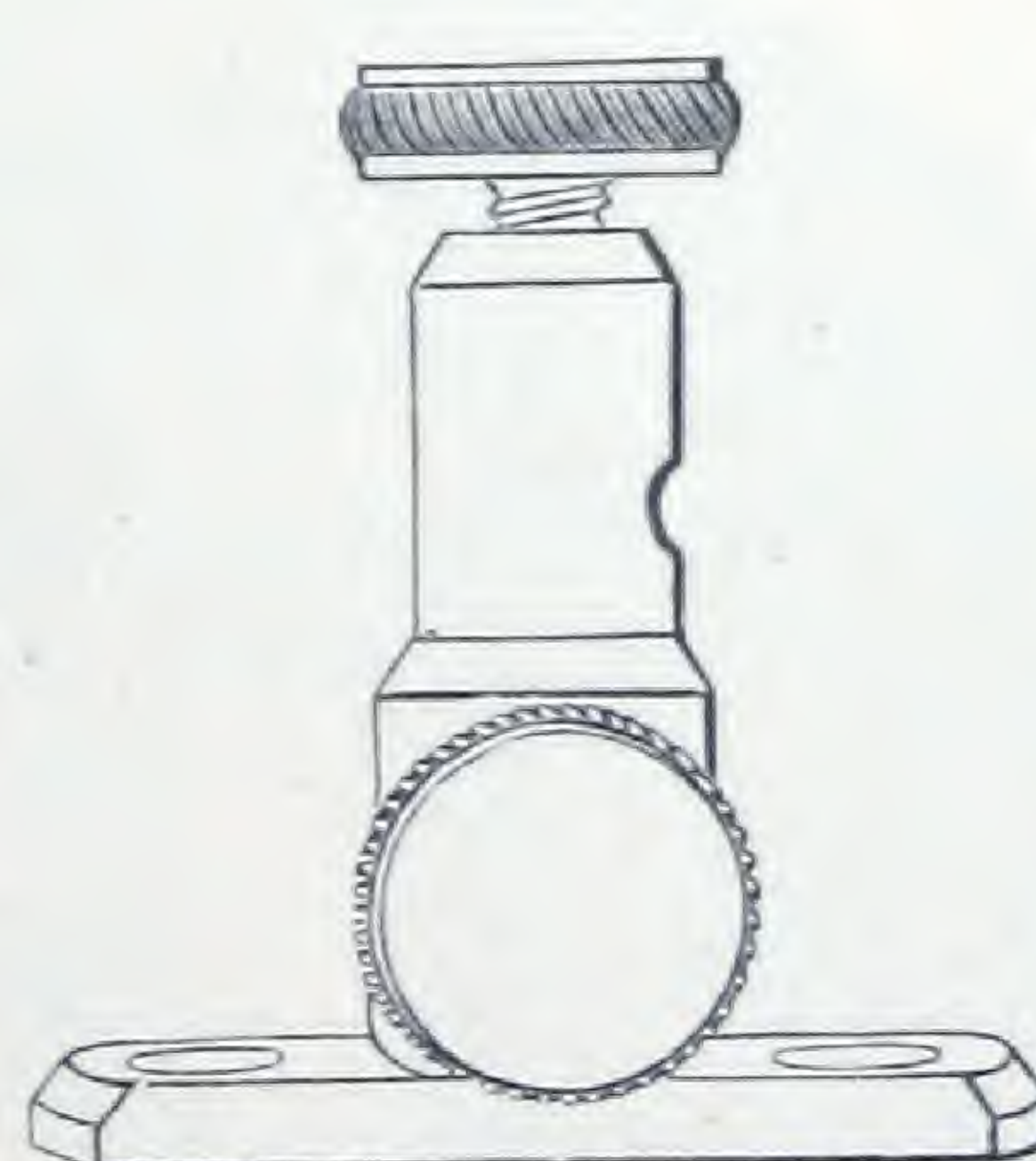
Special Prices per 100.



No. 11, Double,
18c.



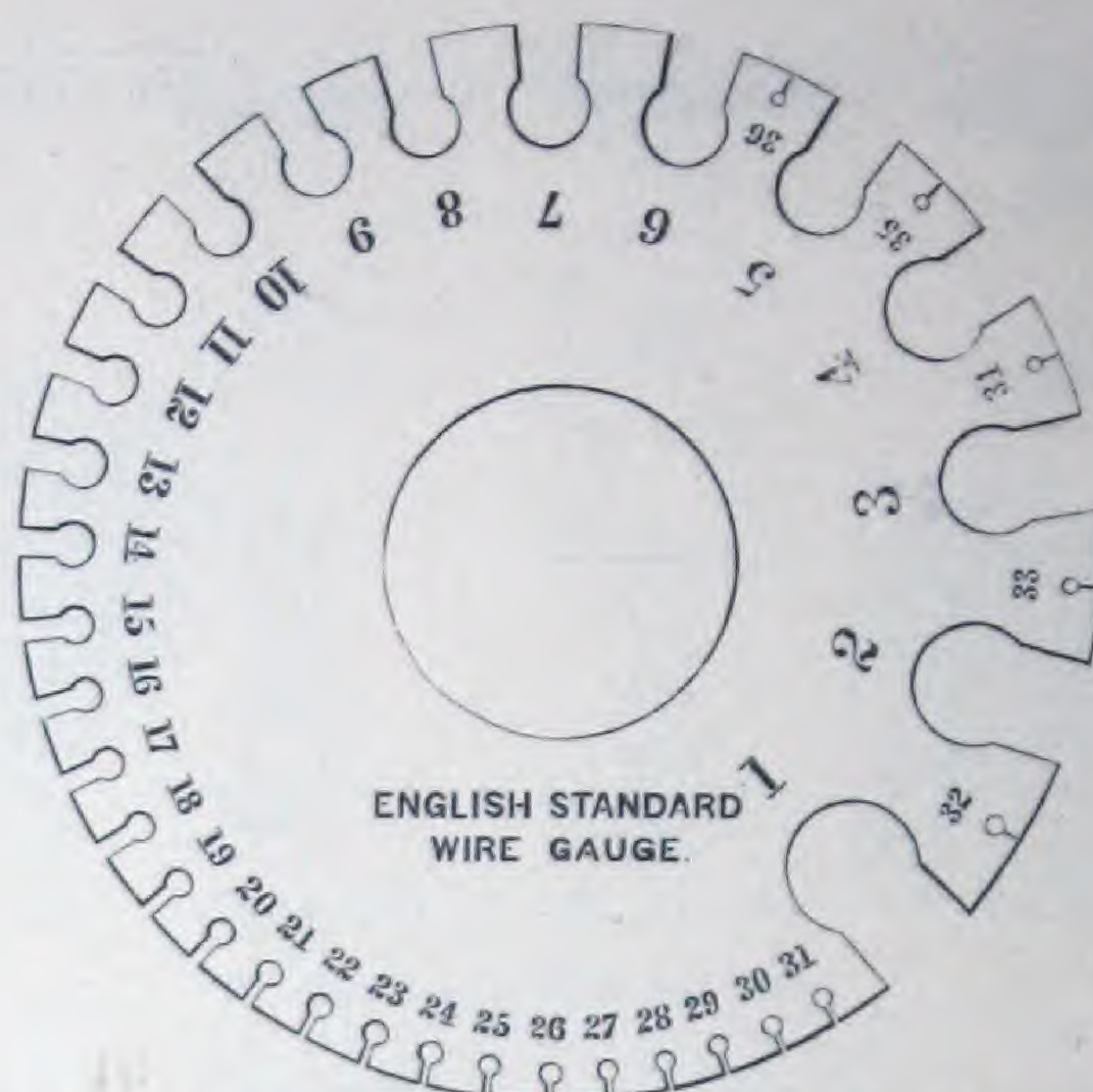
No. 12, Double,
25c.



No. 13, Double,
30c.

Special Rates in Quantity.

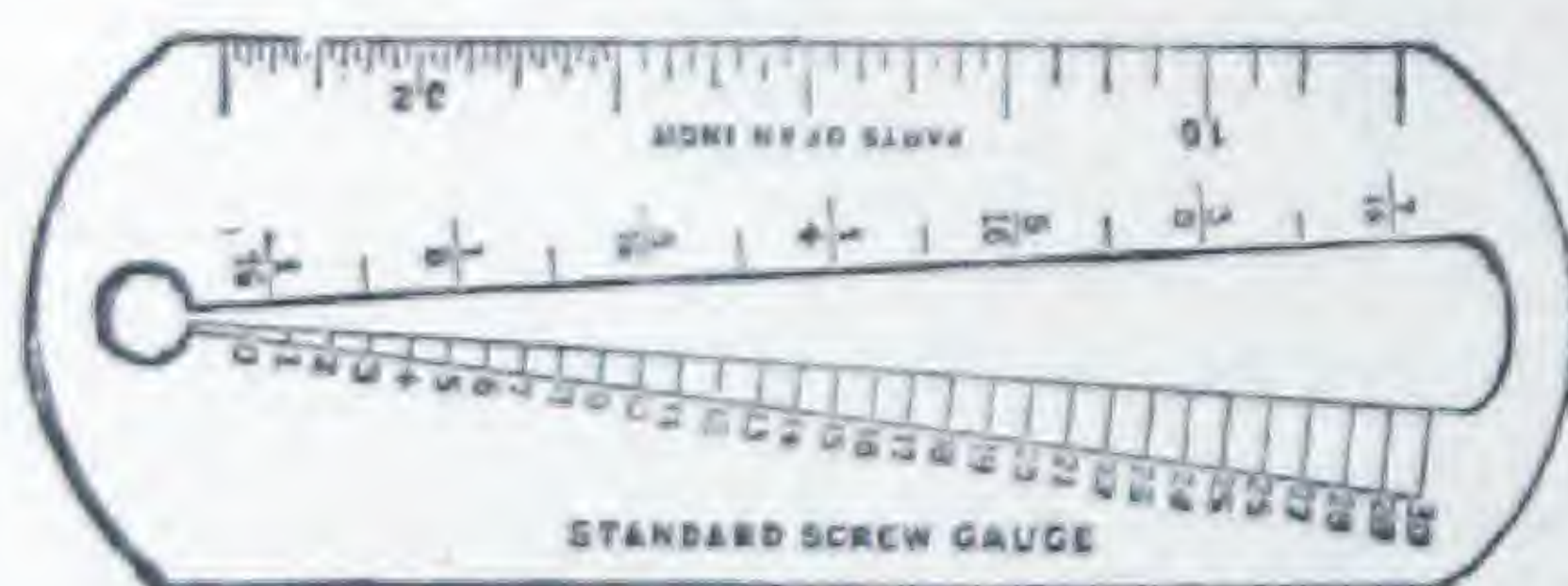
WIRE GAUGES.



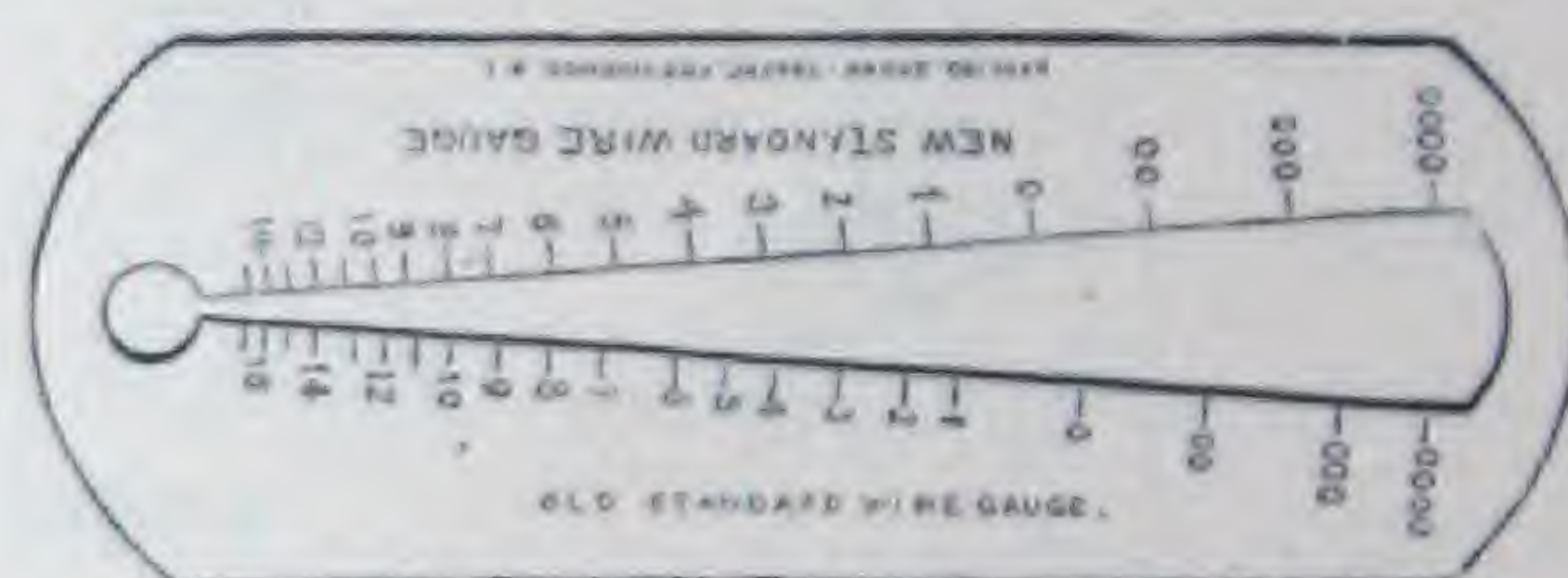
ENGLISH STANDARD WIRE GAUGE.

Price.....\$2 50

POCKET SCREW AND WIRE GAUGE.



FRONT SIDE.

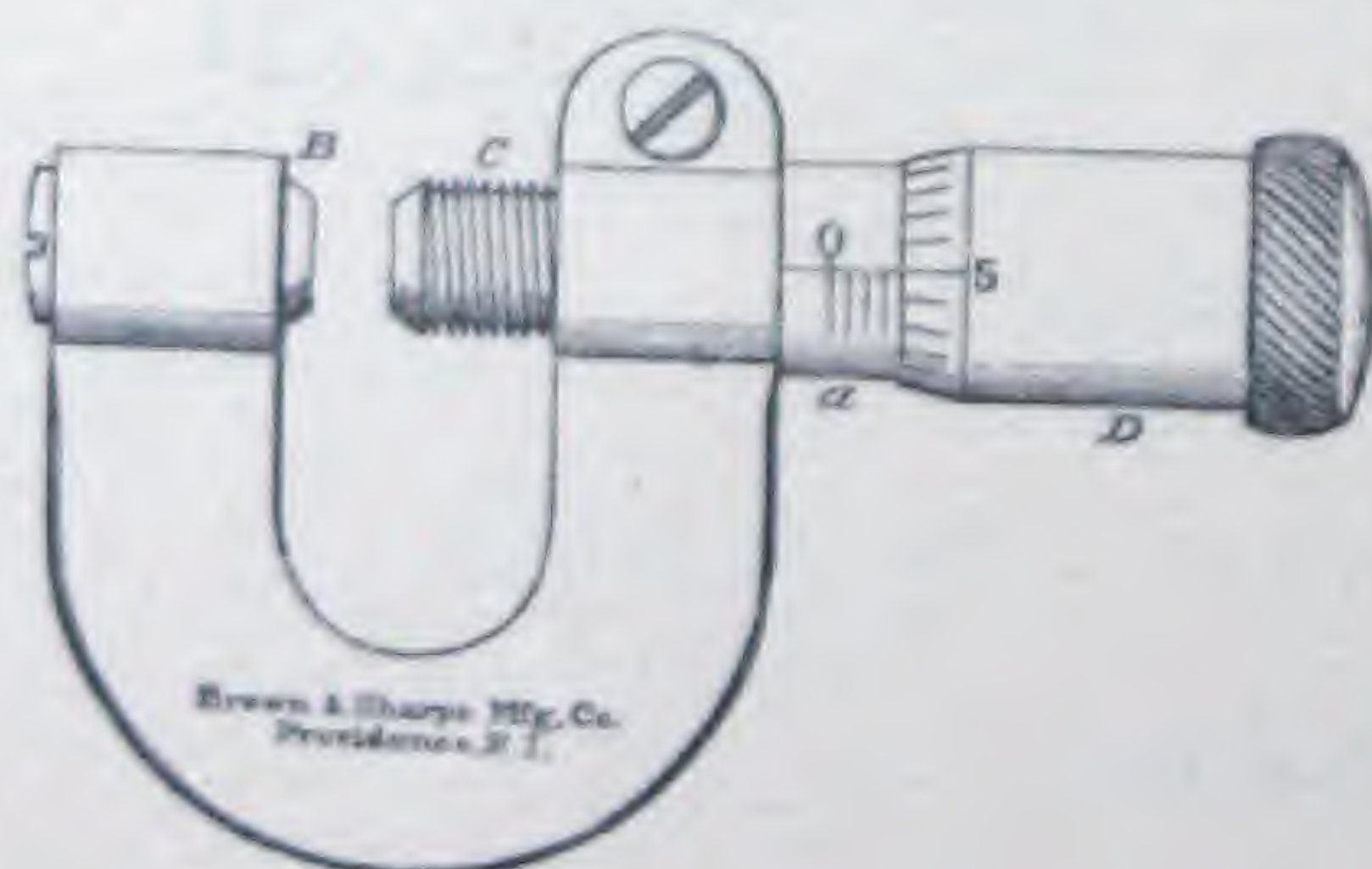


REVERSE SIDE.

On one side is a gauge for all sizes of screws, and a rule for measuring the length of screws. The other side gauges all sizes of wire, by both American and English gauge, from 0000 to 17.

Price.....\$3 50

POCKET GAUGE.



Measures wire or sheet material from $\frac{1}{1000}$ to $\frac{3}{10}$ diameter or thickness.

Price.....\$5 00

" in Morocco Case..... 5 50



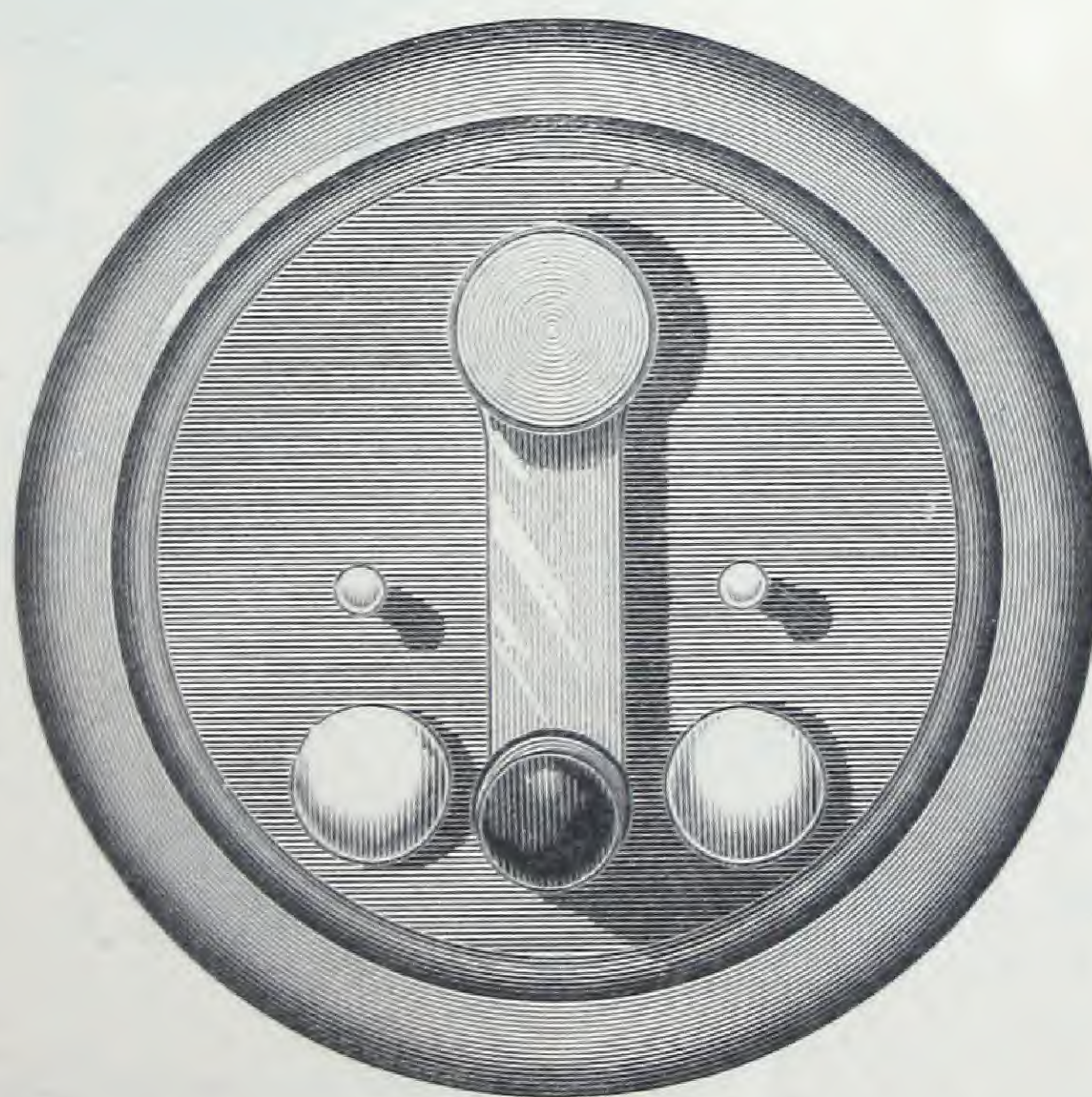
AMERICAN STANDARD WIRE GAUGE.

Price, 0 to 36	\$4 00
“ 5 to 36.....	3 00

SWITCHES.

Wood Base, with Polished Brass
Trimmings.

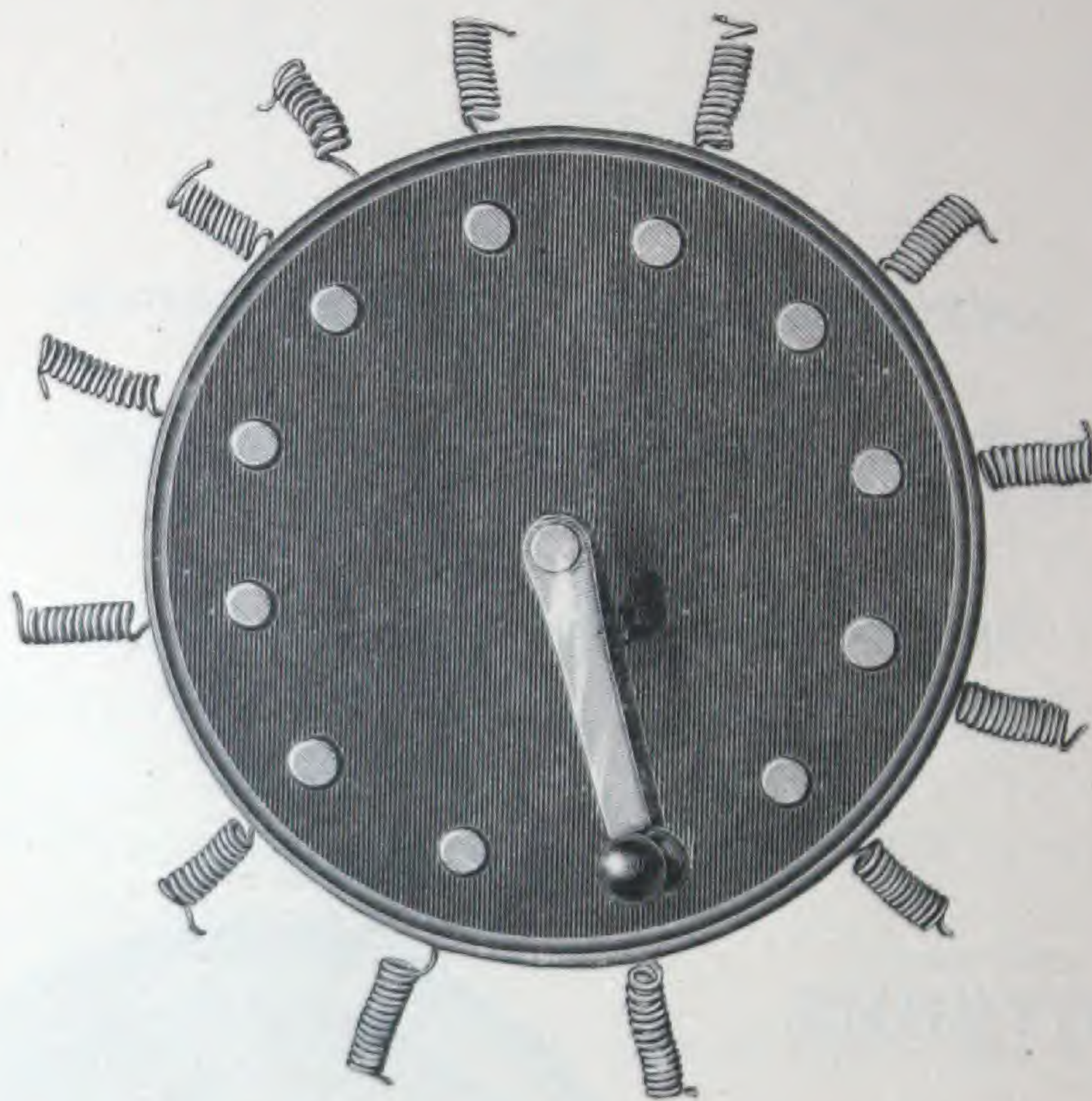
1 Point Switch.....	50 cts. each.
2 “ “	55 “
3 “ “	60 “
4 “ “	75 “
5 “ “	\$1.00 each.



SWITCH—STYLE No. 601.

SPECIAL SWITCHES.

Made to Order. Polished Hard Rubber Base. Nickel-plated Trimmings.



Very handsome in appearance, and especially suitable for
fine house work.

6 Point Switch, No.	675	\$3 00
8 " " "	680	4 00
10 " " "	682	5 00

Special sizes and designs made to order.

THE EUREKA PUSH BUTTON.

This is the smallest and neatest push button, for light work, on the market. It is made of polished rubber, and measures only one inch in diameter by half an inch in thickness. The actual size is shown in the cut. It is just the thing for use in connection with bells, etc., in house interiors, on account of its small size and handsome appearance. It is also extensively used with the Electric Scarf Pin lamp and other electric jewelry.

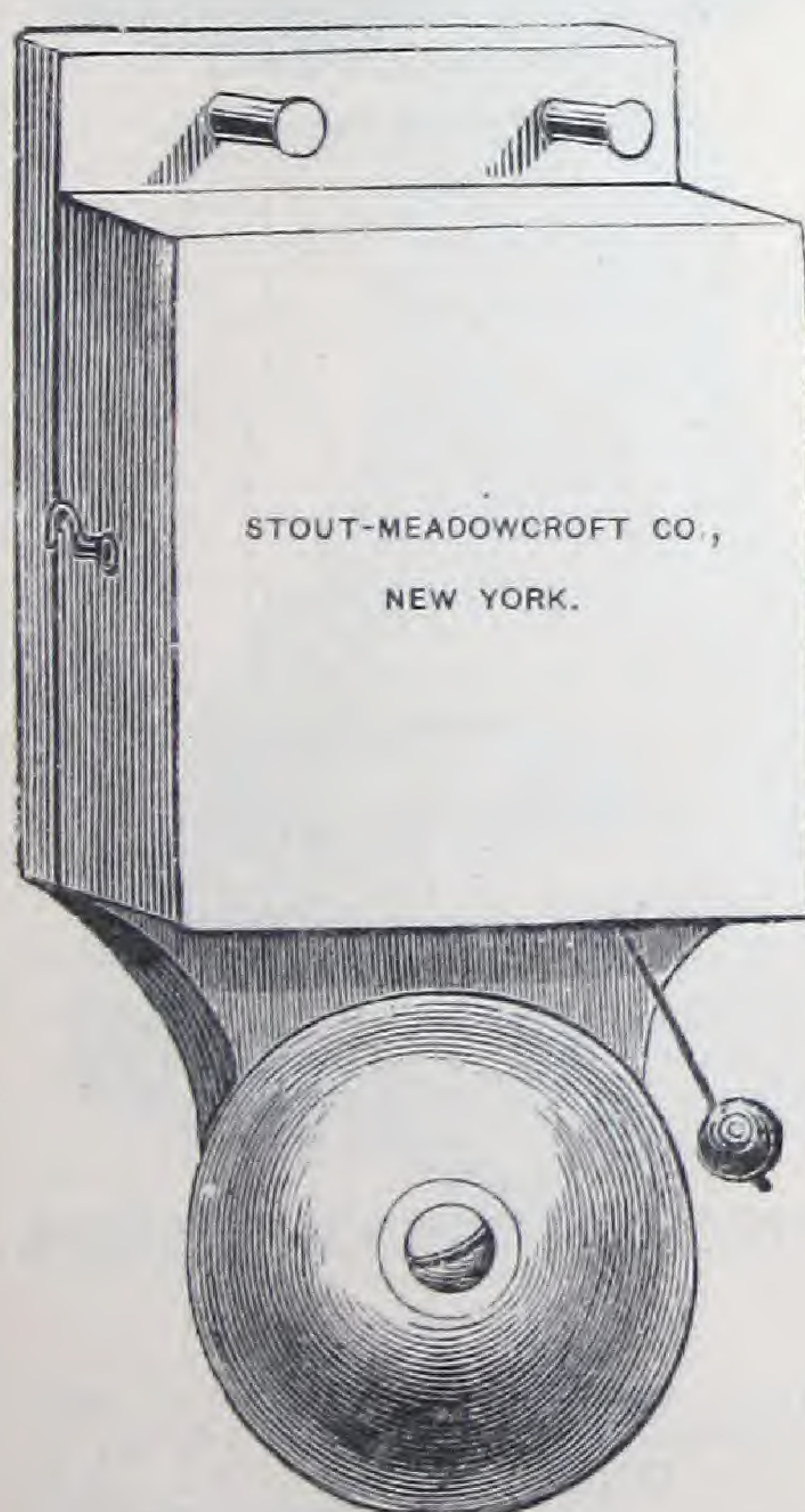


MINIATURE PUSH
BUTTON.

Price, each	\$0 25
“ per dozen	2 40



BOX BELLS.



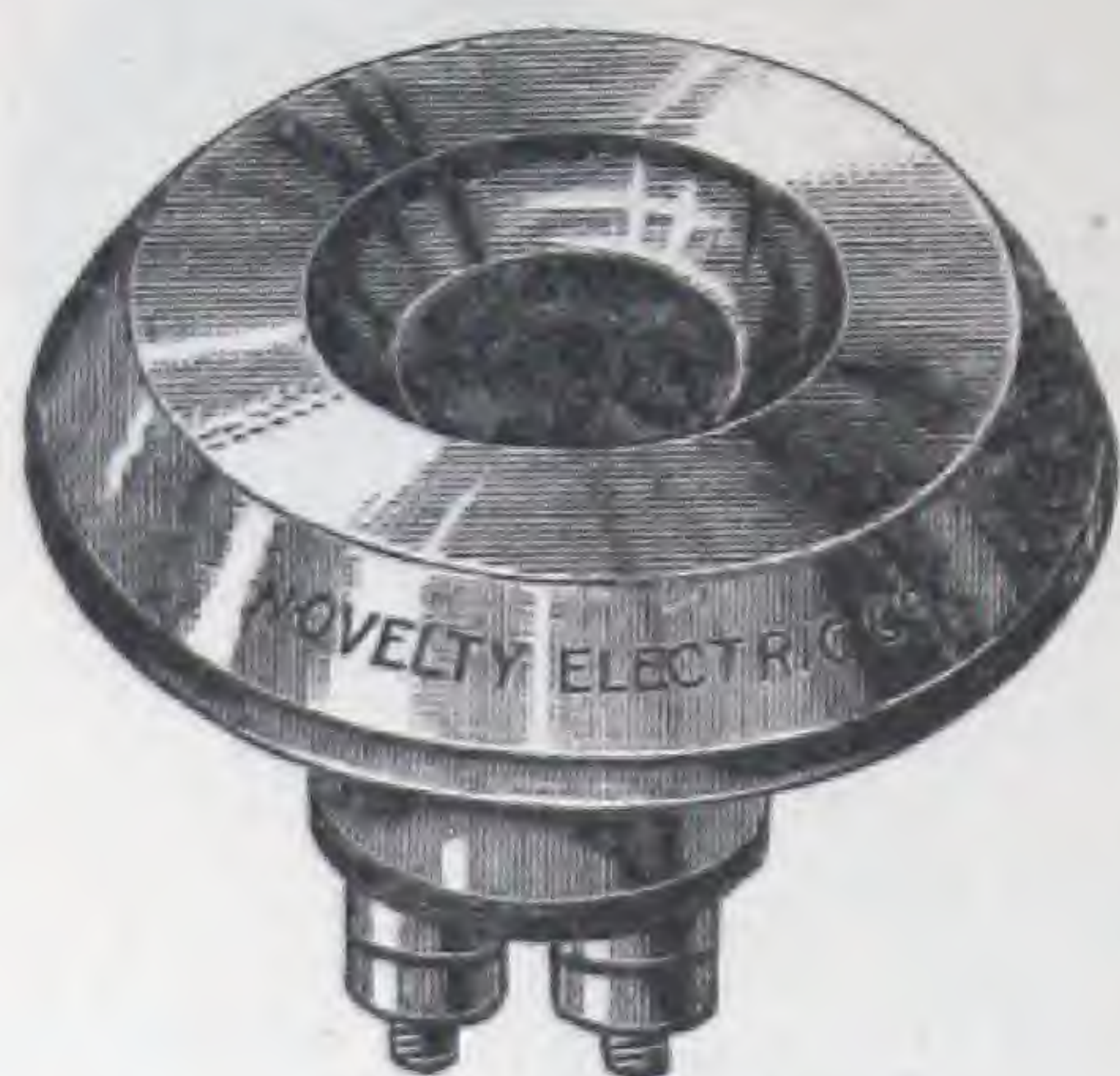
IN POLISHED BLACK WALNUT CASES.

No. 50.	With 2½ inch vibrating bell.....	\$1 75
51.	“ 3½ “ “	2 00
52.	“ 4 “ “	2 25
53.	“ 5 “ “	4 00
54.	“ 6 “ “	5 00
55.	“ 8 “ “	7 00

WITH NICKEL-PLATED BOXES.

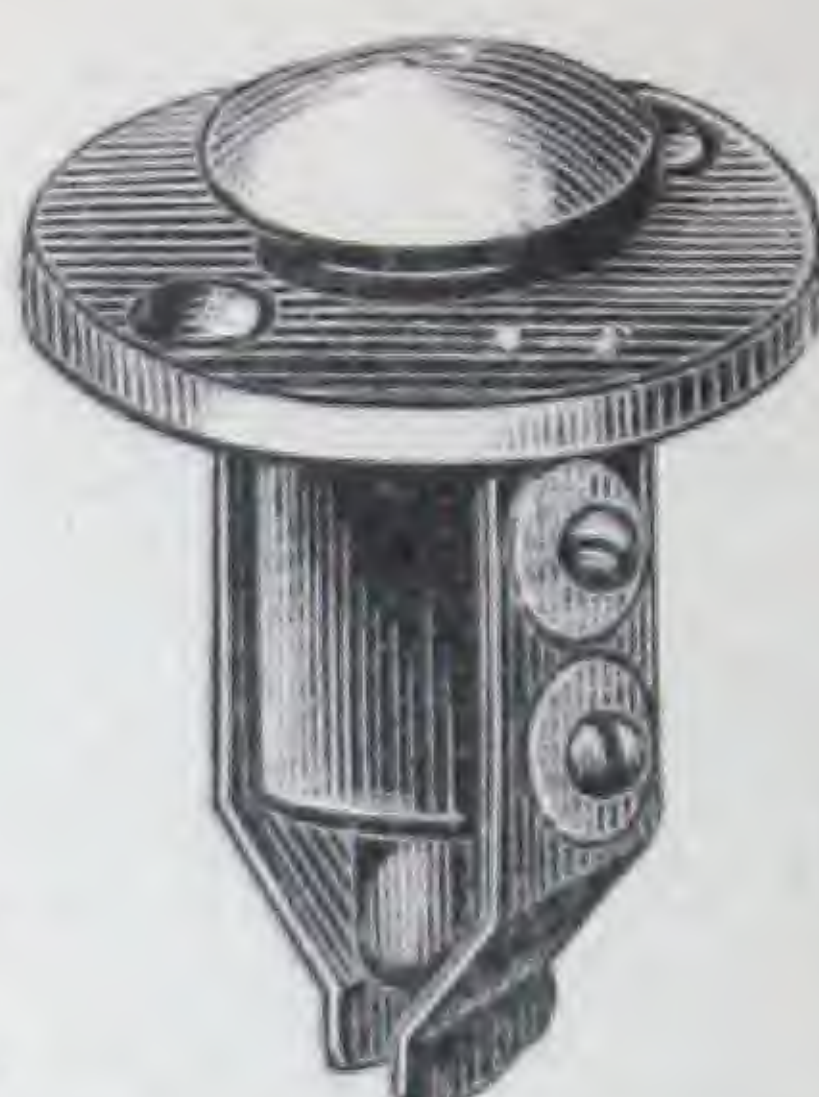
No. 56.	2½ inch vibrating bell.....	\$1 25
57.	3 “ “	1 30
58.	3½ “ “	1 45
59.	4 “ “	1 60

PUSH BUTTONS.



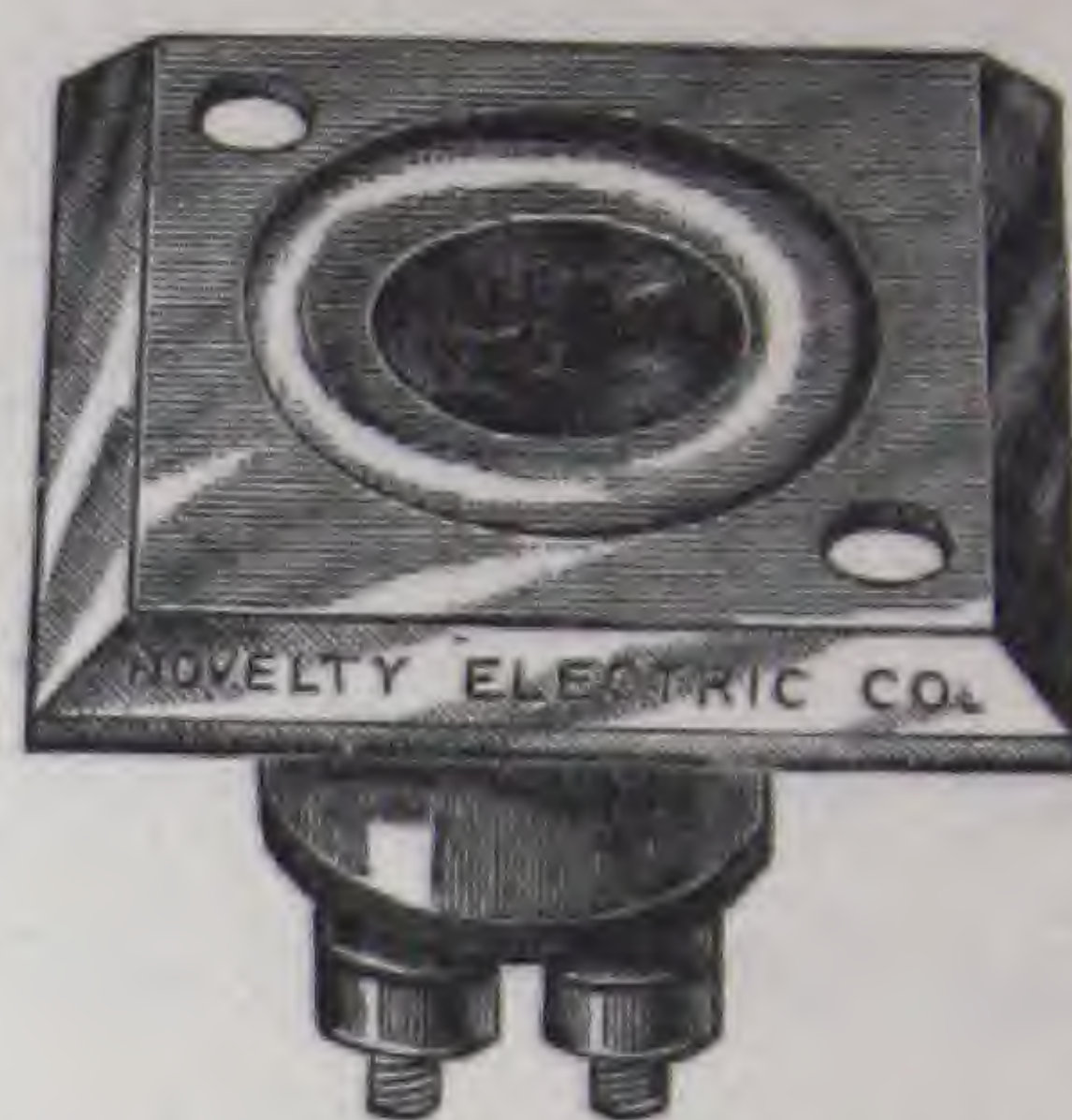
ORNAMENTAL, ROUND.

Price, Brass.....50c.
 " Nickel-plated65c.



ECONOMY PUSH.

Price,
 Nickel-plated...45c.



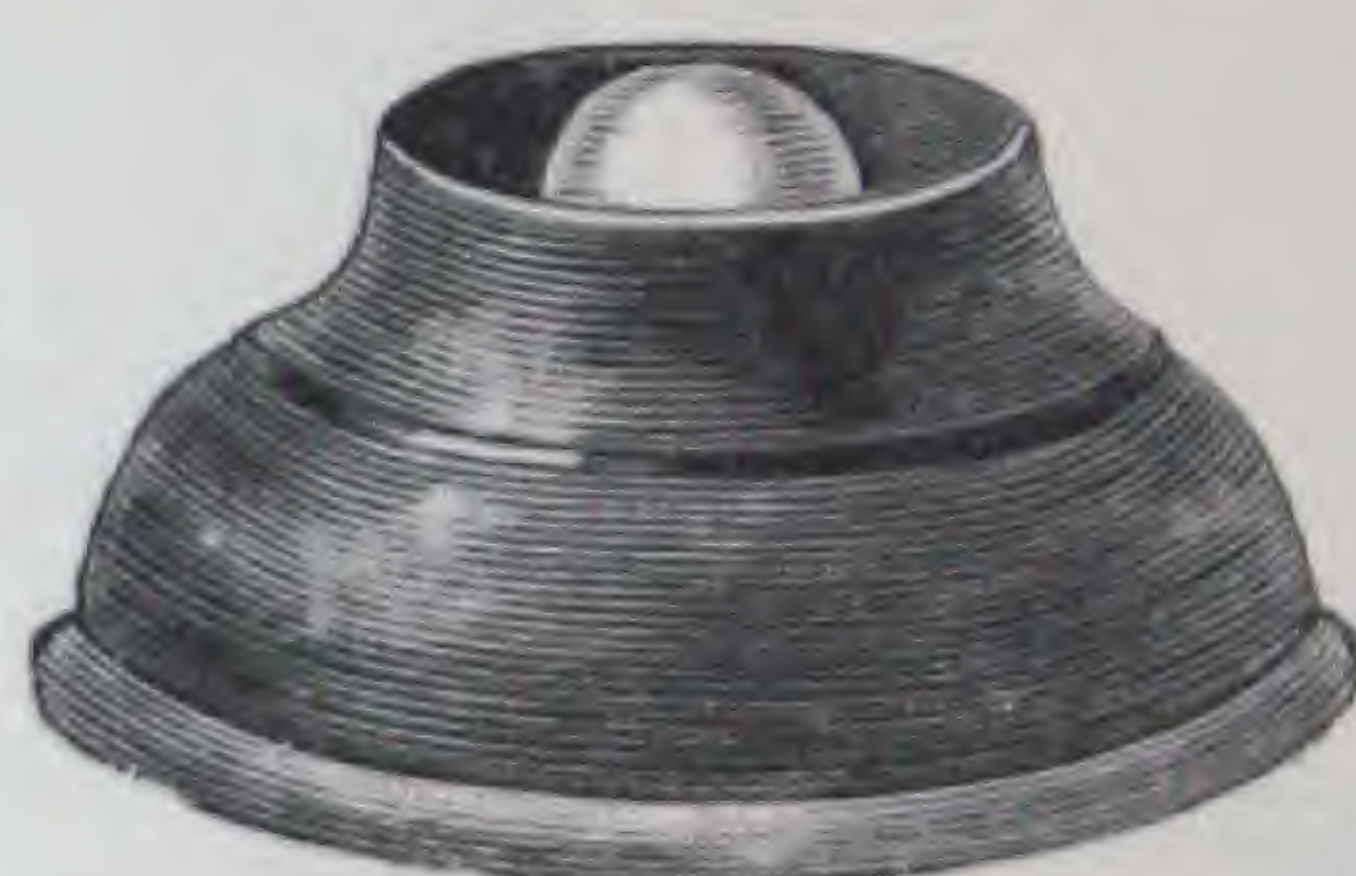
ORNAMENTAL, SQUARE.

Price, Brass.....55c.
 " Nickel-plated.....70c.



ORNAMENTAL, DIAMOND.

Price, Brass.....60c.
 " Nickel-plated.....75c.



WOOD, ROUND.

Price, Rosewood.....30c.
 " Mahogany.....25c.
 " Walnut.....25c.



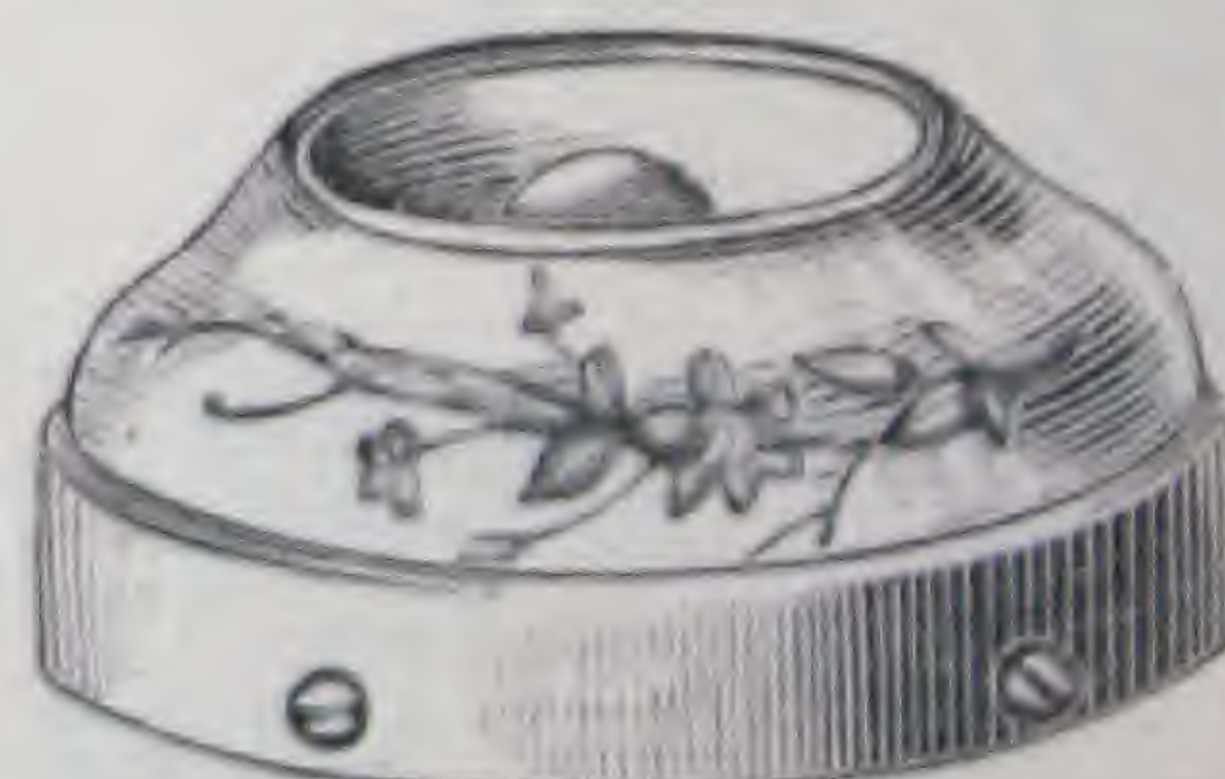
FLOOR PUSH.

Price75c.



BRONZE PUSH BUTTON.

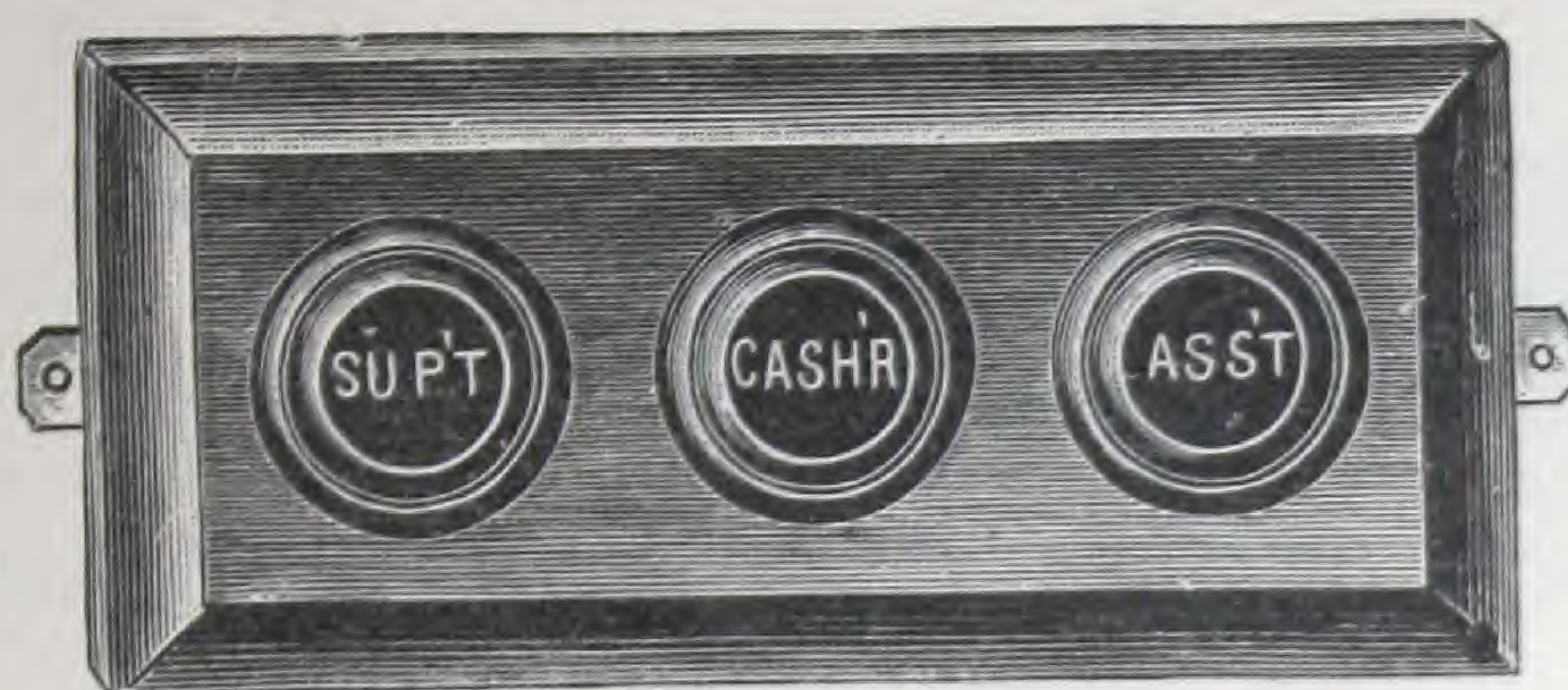
Price, Fancy.....50c.



PORCELAIN PUSH BUTTON.

Price, Fancy.....30c.
 " Plain50c.

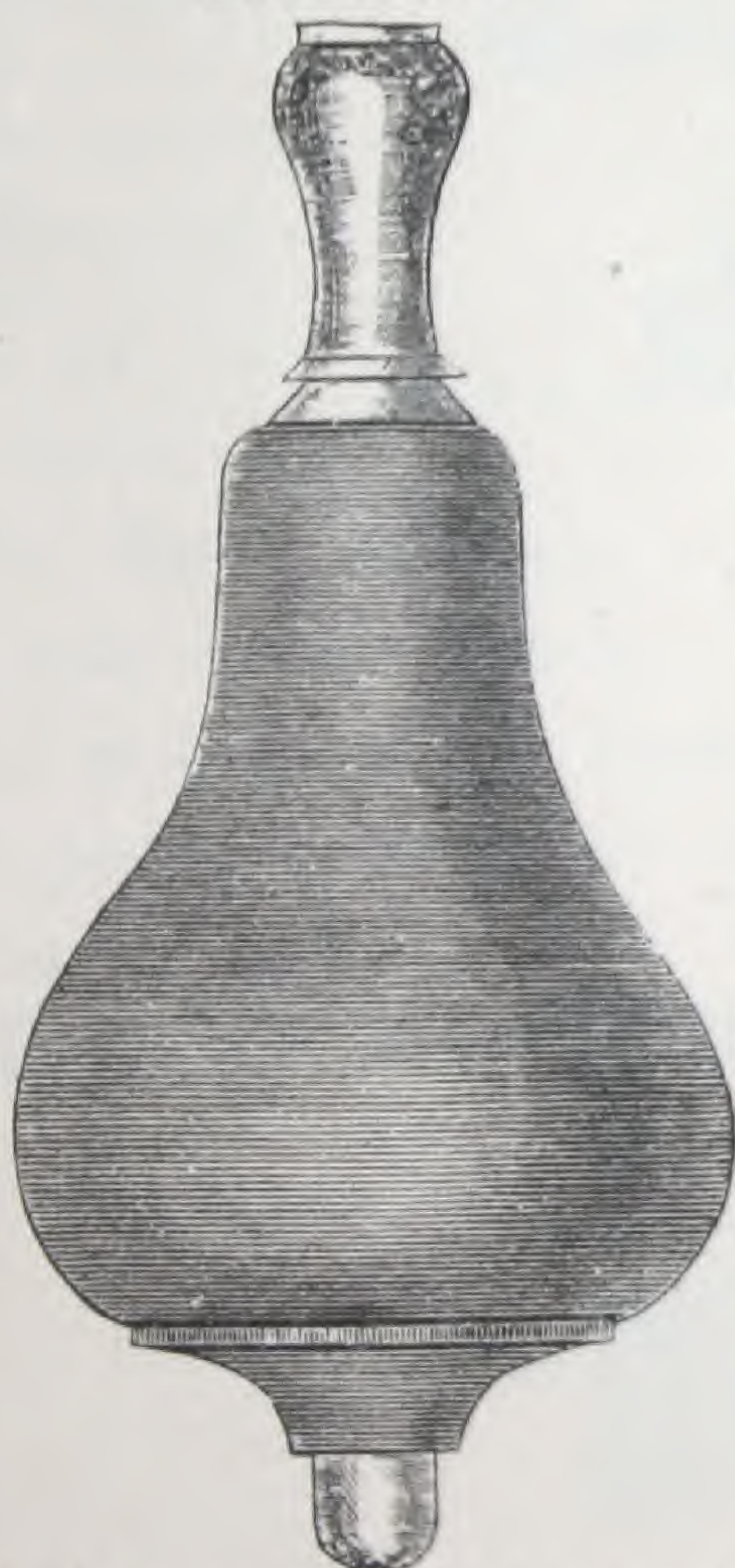
COMPOUND CALL BUTTON.



Hard Rubber Base.

Price, each, 2 Pushes.....	\$3 50
" " 4 "	6 50
" " 6 "	9 50
" " 8 "	12 00
" " 10 "	14 50
" " 12 "	16 50

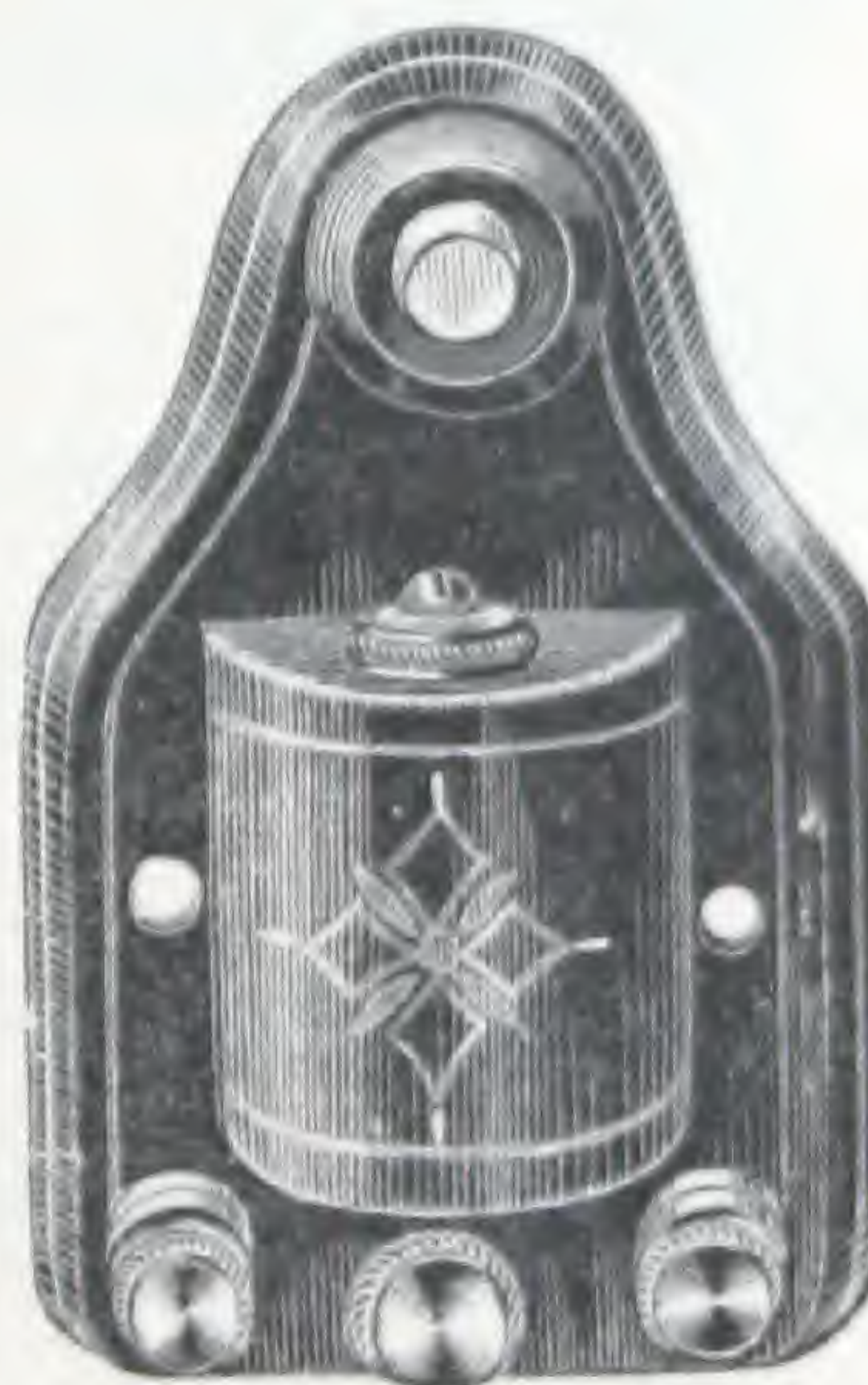
PEAR-SHAPED PUSH
BUTTON.



To be Attached to Electric Bell Cord.

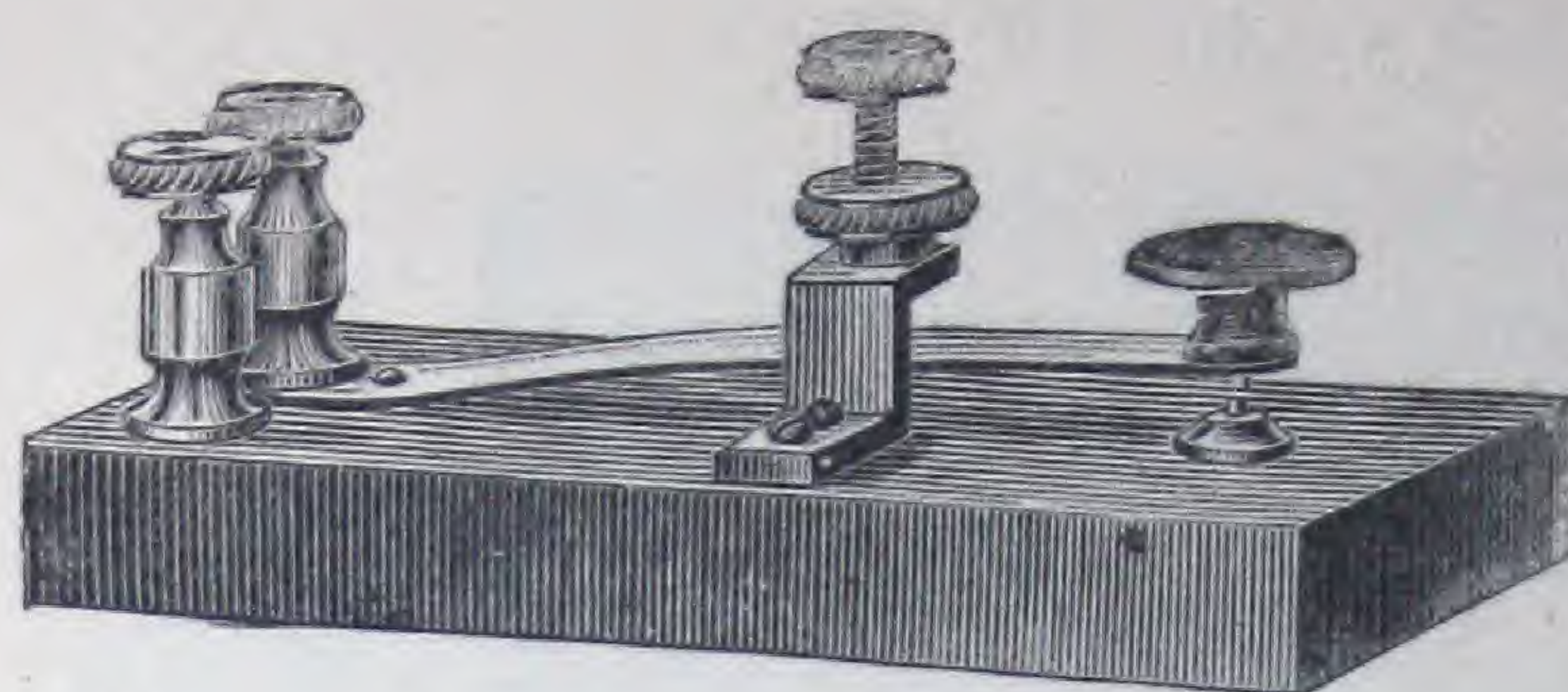
Price, each... \$0 75

THE RATTLER PUSH
BUTTON.



For indicating that the Bell
rings at a distant end of the
wire when the button is
pressed.

Price\$1 75



STRAP or SIGNALING KEY.

Price, Open Circuit.....	\$0 75
“ Closed Circuit.....	75
“ Double Circuit... ..	1 00



INDUCTION COILS.

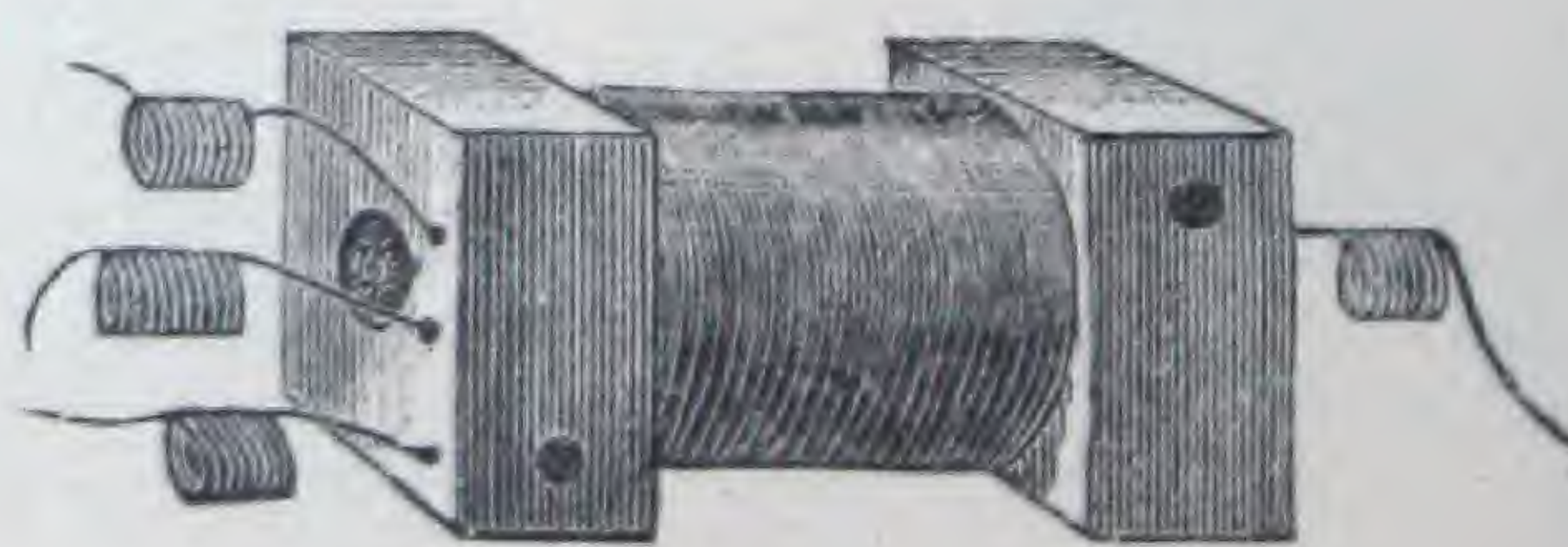
WITH AUTOMATIC BREAK.

$\frac{1}{8}$ -inch Spark	\$4 00	$1\frac{1}{4}$ -inch Spark	\$35 00
$\frac{1}{4}$ “ “	8 00	$1\frac{1}{2}$ “ “	40 00
$\frac{1}{2}$ “ “	12 00	2 “ “	60 00
$\frac{5}{8}$ “ “	18 00	3 “ “	100 00
$\frac{3}{4}$ “ “	25 00	4 “ “	125 00

Coils with Sparks, 5 to 18 Inches, to Order.

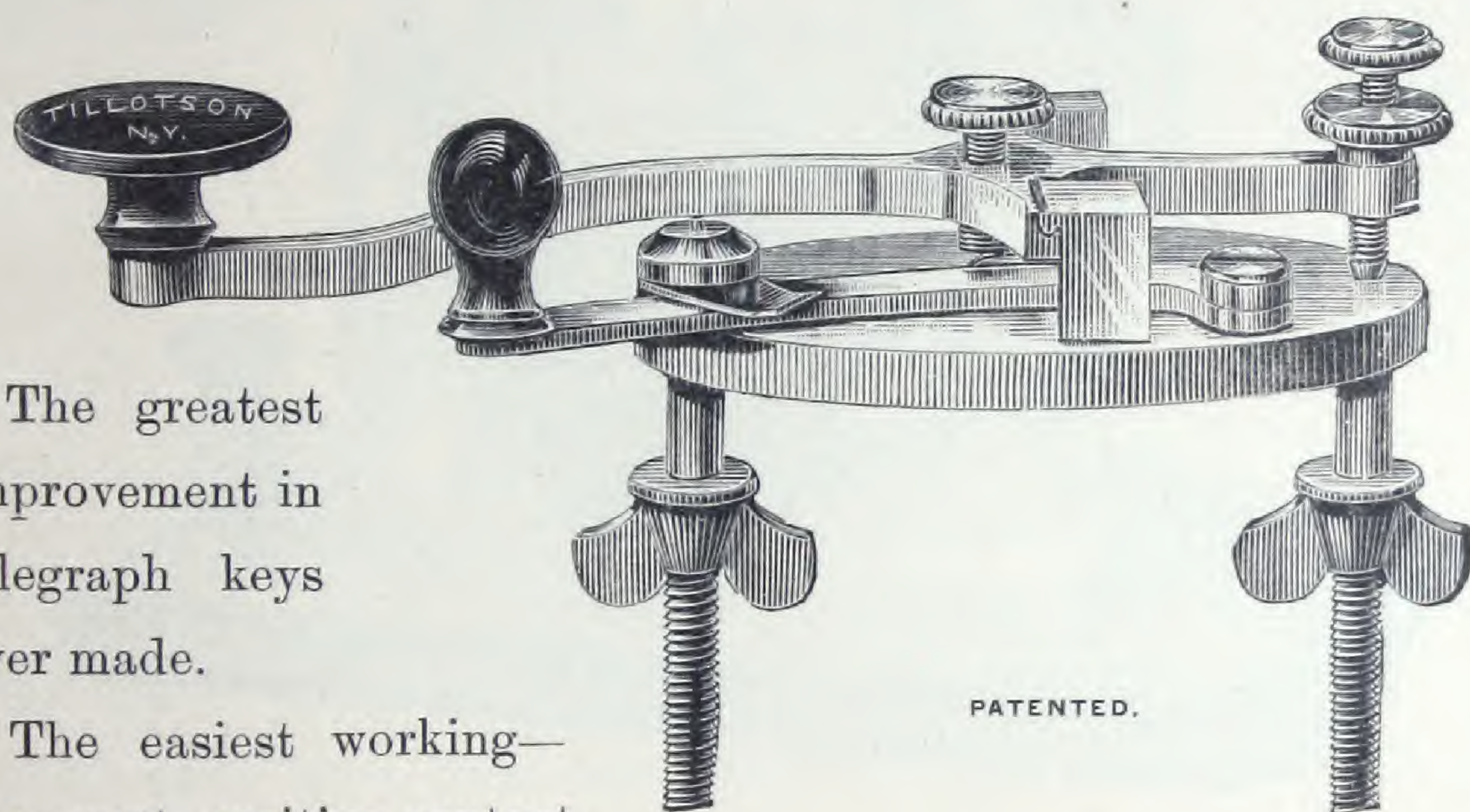


EXPERIMENTAL INDUCTION COILS.



Price, each.....\$1 50

THE NEW STYLE VICTOR TELEGRAPH KEY.



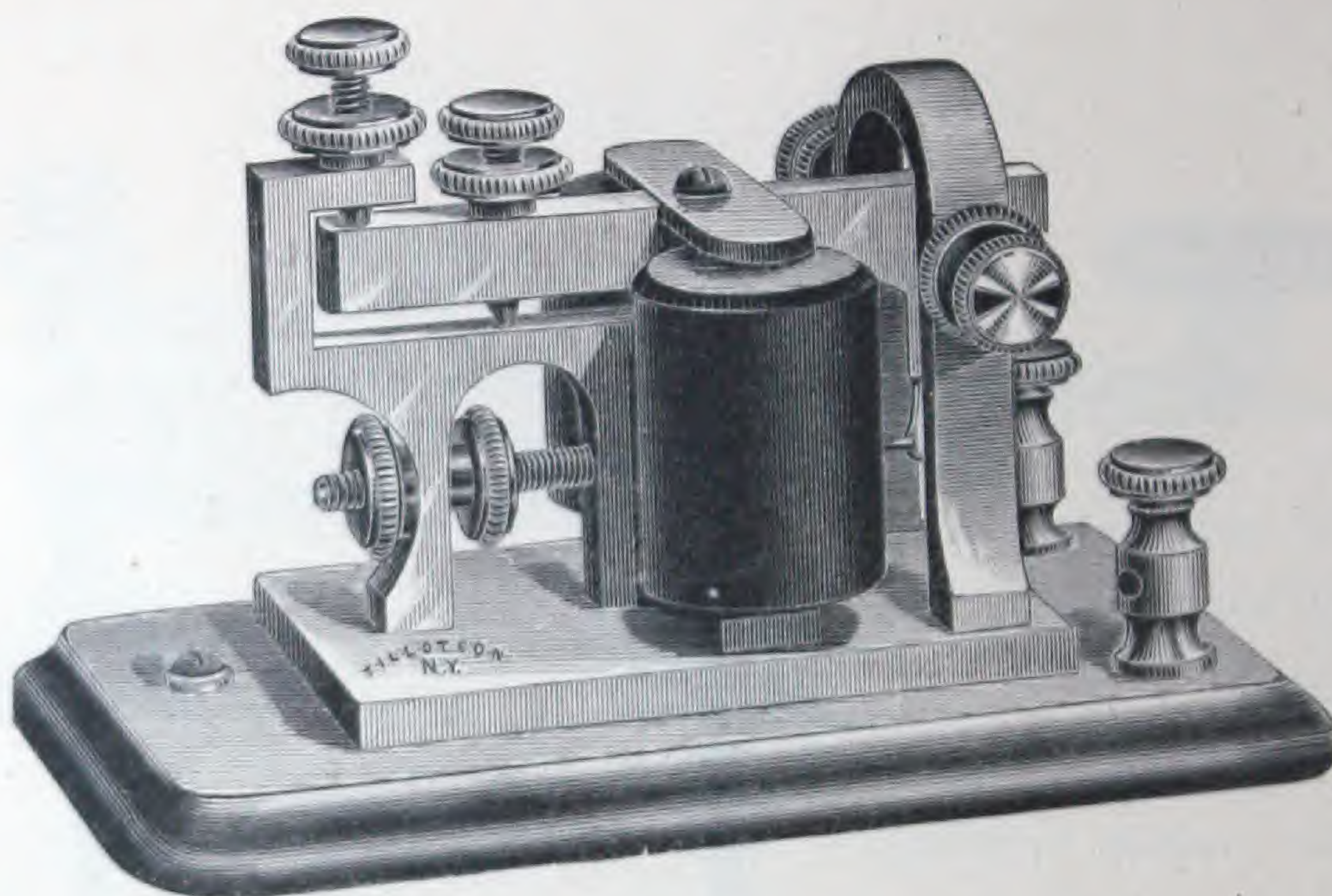
The greatest improvement in telegraph keys ever made.

The easiest working—the most positive contact—the most perfect in construction—no trunnion connections—no side motion to the lever. The neatest, nicest, handiest and best key in the world.

Price.....\$2 50

LATEST IMPROVED GIANT SOUNDERS.

THESE SOUNDERS RECEIVED THE FIRST PREMIUM OVER ALL COMPETITORS AT THE CENTENNIAL EXHIBITION.

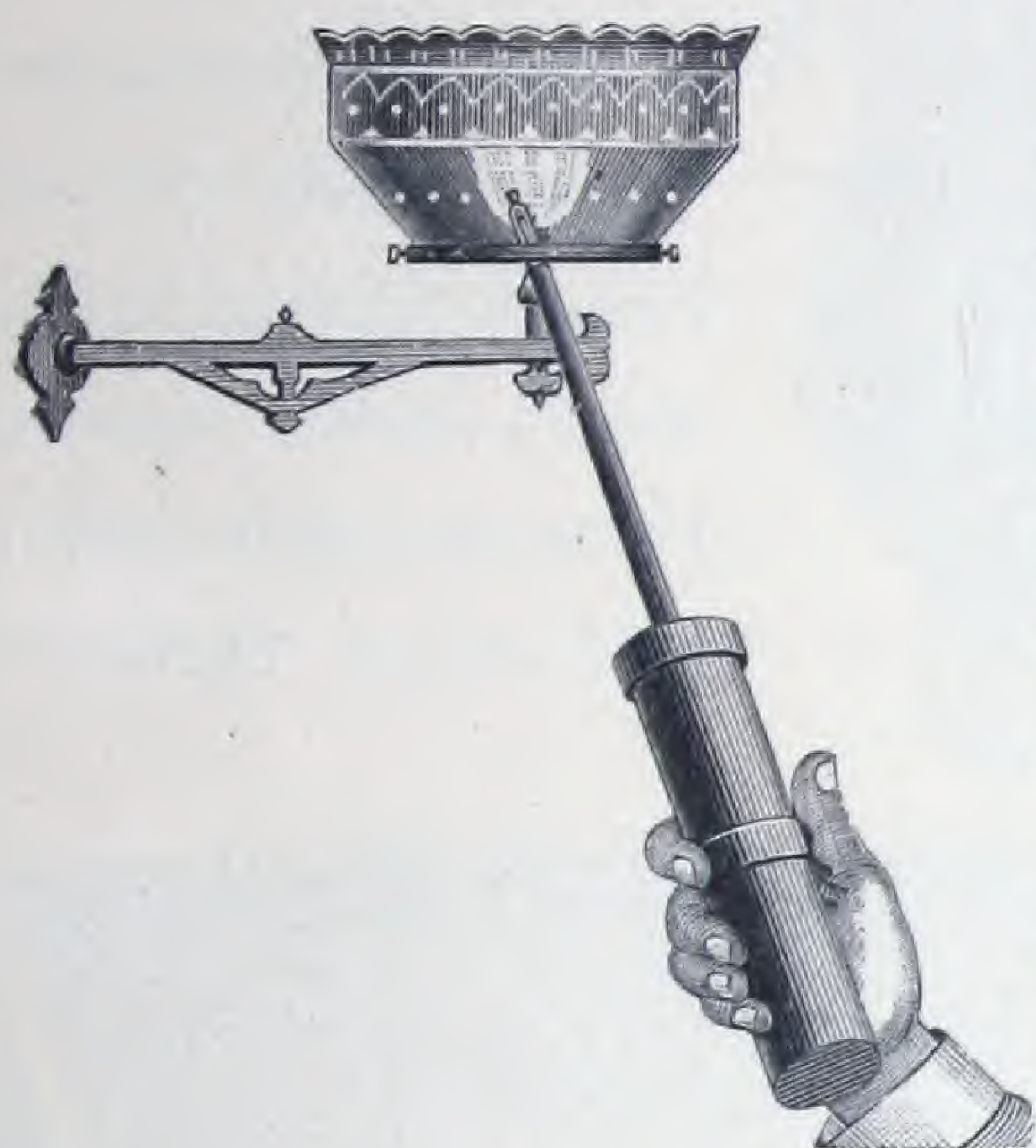


Beautiful in appearance, highly finished, and put up in the most durable and substantial shape. They give enormous sound with but very little local battery power, and have been adopted as the standard sounder upon every telegraph line throughout the country. Telegraphers will note particularly that the double set screw front adjustment is used on all of our Giant Sounders.

Price.....\$3 50

NEW PORTABLE DYNAMO GAS-LIGHTER.

THE LATEST ELECTRICAL INVENTION. ABSOLUTE SAFETY FROM FIRE.
ALWAYS READY FOR USE. NO BATTERY. SIMPLE,
RELIABLE, ENTIRELY MECHANICAL.



The gas is turned on by the clutch at the end of the stem. The opening in the stem is then placed about half an inch above the burner. Press the button in the handle, when the spark is thrown to the point and the gas is instantly ignited. This igniter will set fire to nothing but gas. Its use does away with matches, tapers, and alcohol torches, which smoke

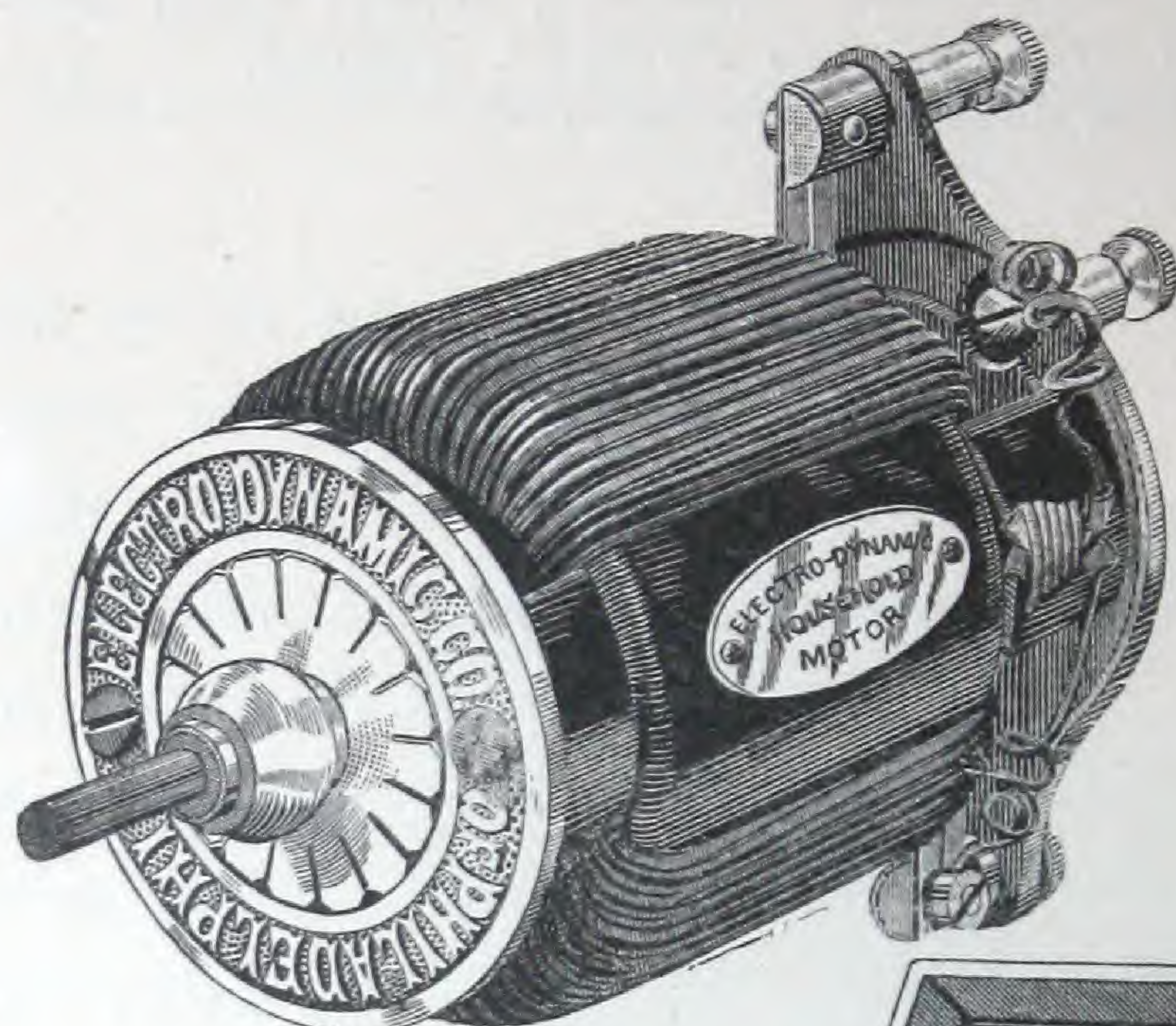
the globe, soil the fixtures and occasion frequent fire losses. It is made very neat and attractive, with brass or nickel-plated trimmings.

PRICES.

	BRASS TRIMMINGS.	NICKEL-PLATED TRIMMINGS.
9 Inch Stem	\$5 00	\$5 50
15 " "	5 50	6 00
20 " "	6 00	6 50
30 " "	6 50	7 00
36 " "	7 00	7 50
48 " "	8 50	9 00

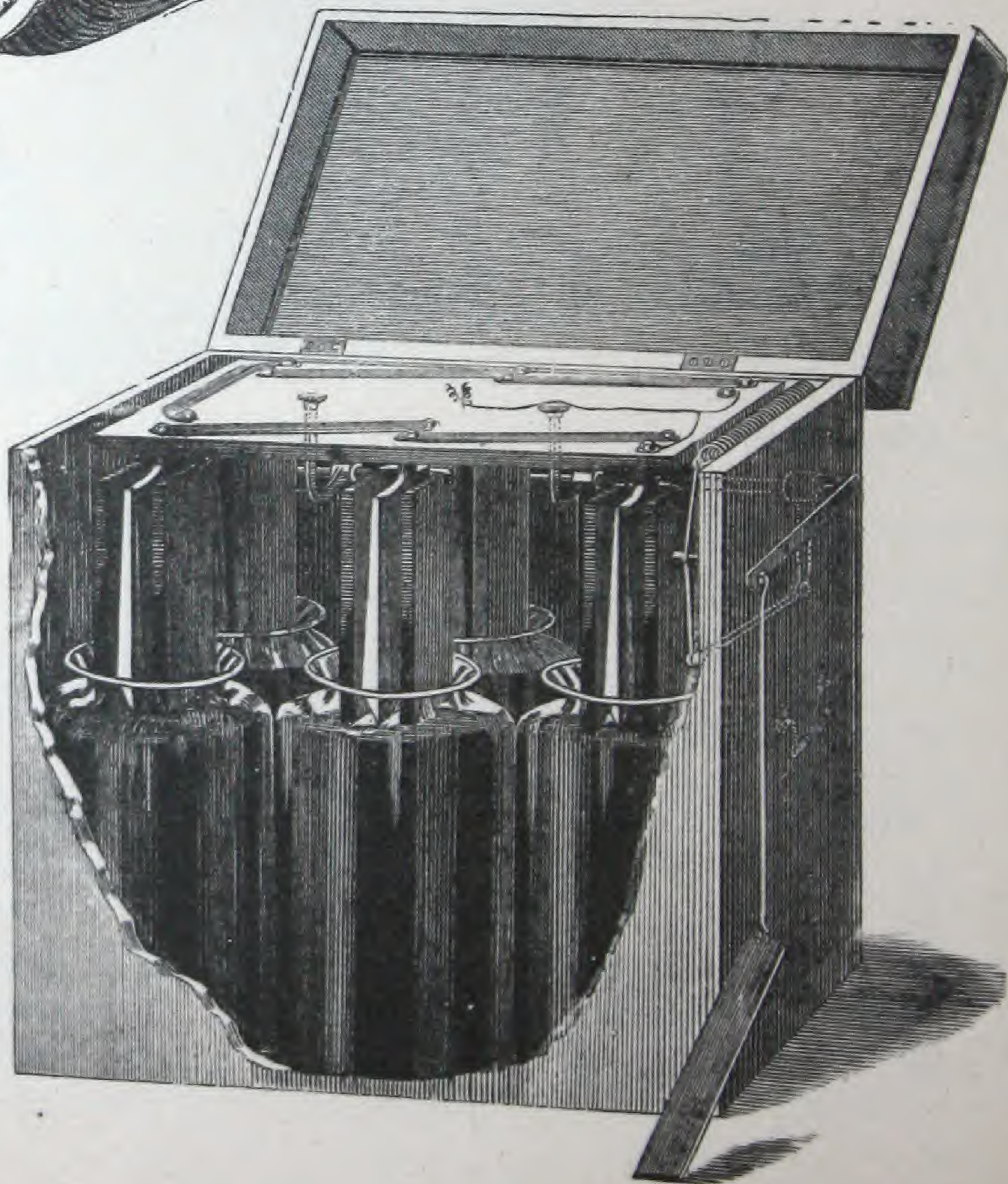
THE DOUBLE INDUCTION MOTOR.

A Practical Electrical Motor for Sewing-Machines and Small Power.



Simple in construction, strong and durable; low in price; always ready for use. Weight, forty ounces. Length (not including shaft), four inches. Diameter, two and a half inches. Operated

by the PATENT AUTOMATIC BATTERY. Average weight, ready for use, ninety-five pounds. Generates electricity only when in use. Gives no shock, emits no odor, is always in readiness, is under perfect control. Many



weary hours of labor, and much sickness avoided by using this little motor on the sewing-machine; thus getting rid of the necessity for using the treadle. The battery box is just the right height to serve as a seat for the sewing-machine, and can be so used, or may be left in a closet or adjoining room. With this battery and motor an ordinary day's treadle sewing can be done in two or three hours.

The motor is very portable, its weight when running, complete, being only two and a half pounds. It is durable and not likely to become disarranged. It affords a motion which can be stopped, reduced or accelerated instantaneously by an almost unconscious pressure of the feet. It is small and ornamental, and can be attached to any machine.

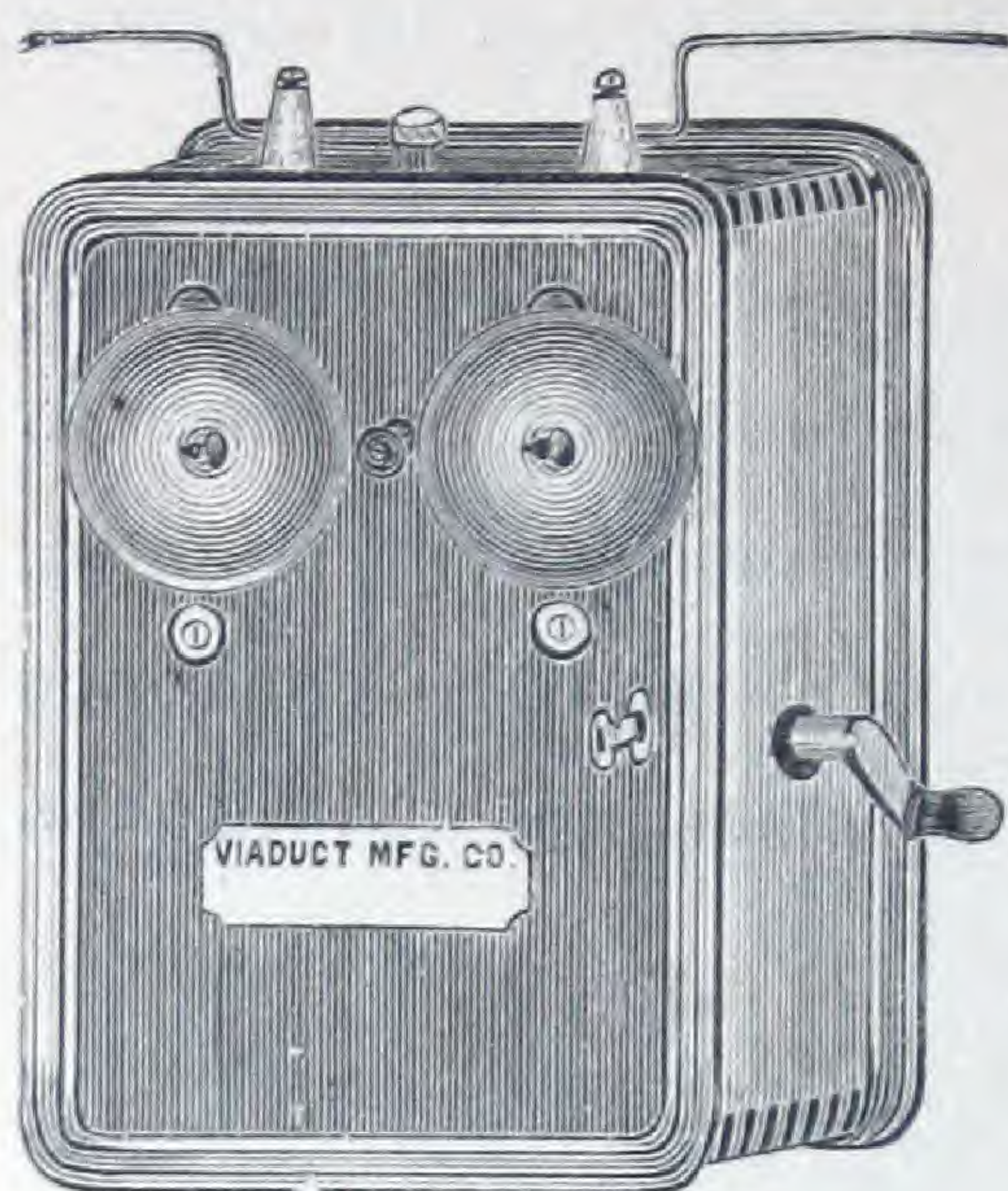
There is no danger from shocks.

COMPLETE APPARATUS FOR SEWING-MACHINE.

Complete apparatus for driving a family sewing-machine, including a Double Induction Motor, Improved Automatic Battery, six gallons of fluid (or twelve pounds bichromate of potash), pulley, belt, iron hanger, and all other needful attachments, including packing in strong cases for distant buyers	\$40 00
Double Induction Motor, nickel-plated.....	16 50
Same, with hanger, belting, pulley, packed for transportation by mail, postage prepaid to any part of the United States.....	18 00
Patent Double Induction Motor, with reversing attachment.....	21 00
Nickel-plated Dental Motor.....	21 00
Improved Automatic Battery, six one-gallon cells, each containing double carbons, two and a half inches wide by four and a half inches long, one amalgamated zinc, all inclosed in stained box, with lock and handles	20 00

MAGNETO SIGNAL BELLS.

NO BATTERY REQUIRED.



They are being adopted very extensively in place of the telephone, by arranging for a different number of signals to signify certain things, for example: one ring to call a carriage, two rings to call a messenger, etc., according to the requirements, or convenience of the party using them.

The Cabinet Bell is very handsome. It is divided into two compartments, the upper of which is made to receive an ordinary transmitter and hand telephone, and the lower to receive the battery.

We make several different forms of this bell, in order to suit the idea of the purchaser.

The Standard Magneto Bell, though not so handsome as the "Cabinet," is equally as fine in construction; and is simply a signal bell.

It is first-class in every respect, and has a resistance sufficient to ring through eight to ten thousand ohms. It will work on a line of almost any length required, and will give satisfaction. We also have

The Pony Magneto Bell, intended for use on shorter lines than the "Cabinet" and "Standard" Bells. It is similar to the "Standard" in construction, except that it is wound to a

resistance sufficient to ring through two thousand ohms. On lines of only a few miles in length, it will answer fully the purpose of signaling.

These bells are used by a great many in place of the telephone, and, as they do not require any battery, and the cost being comparatively small, the demand for them has greatly increased within the past year.

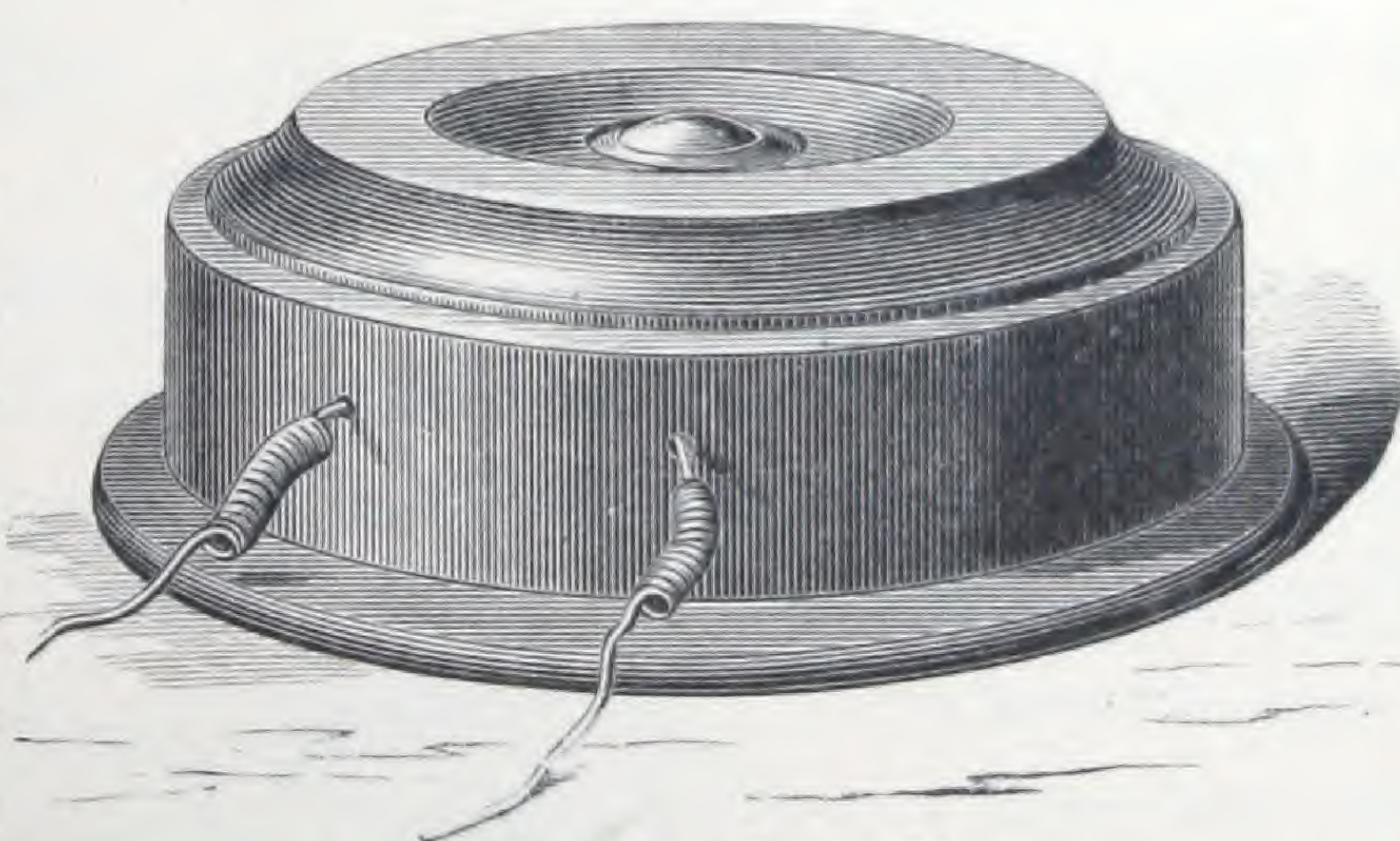
Price of the "Cabinet" Bell, \$7.00 and upwards, according to the style; "Standard" Bell, \$6.00; "Pony" Bell, \$5.00.

We also have a lot of second-hand magneto bells which we sell at \$4.00 each.

HILL'S PATENT ELECTRIC FIRE ALARM THERMOSTAT.

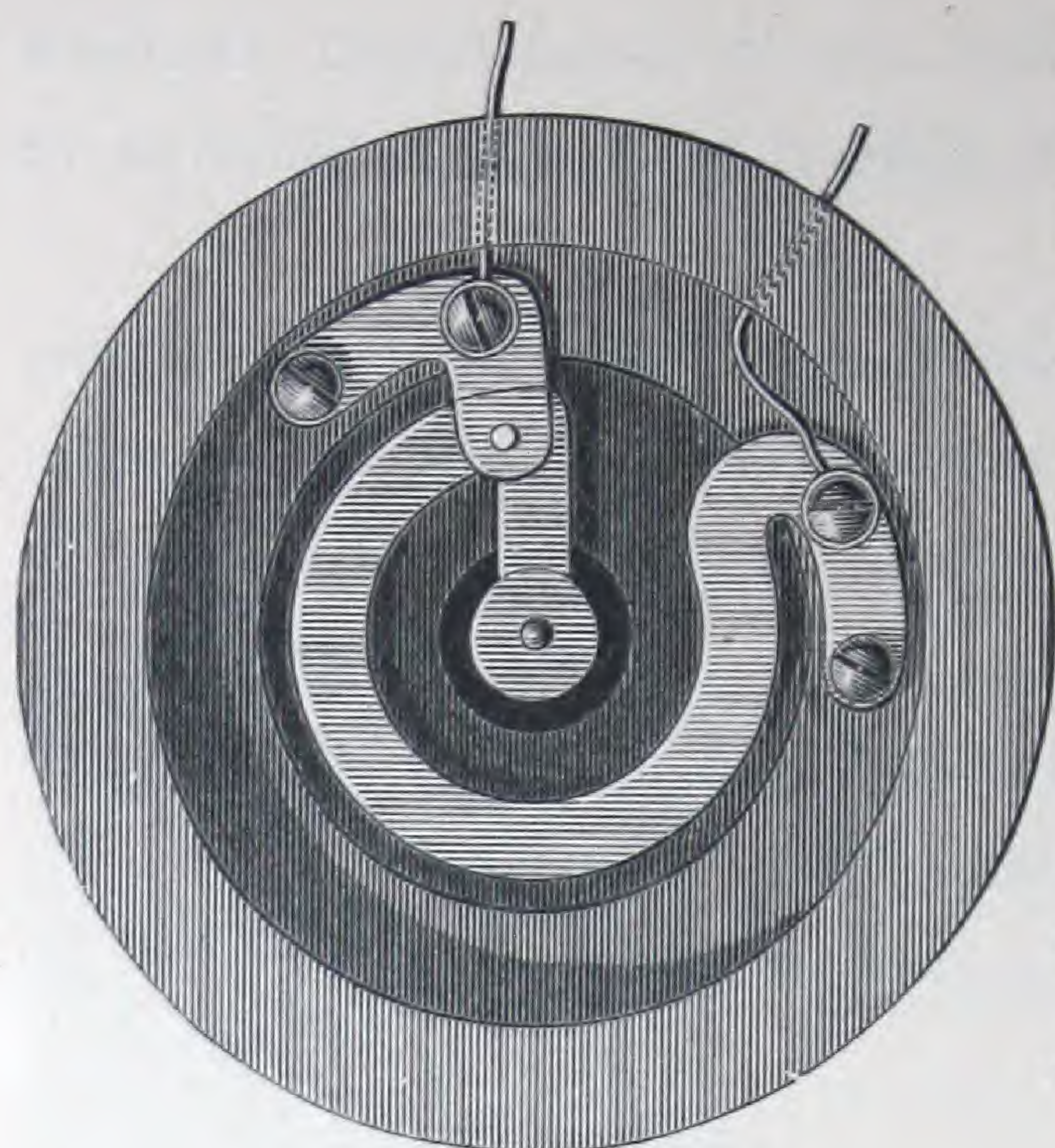
FURNISHED FOR EITHER OPEN OR CLOSED CIRCUIT.

These engravings fully illustrate the details of the Open Circuit Electric Thermostat Fire Alarm. The cap and base are of non-conducting wood, exterior surfaces fin-



FULL SIZE—PRICE 50c.

ished and varnished. The electrodes are of hard drawn spring brass. The contact points are pure platina. Sensitive disk "B,"

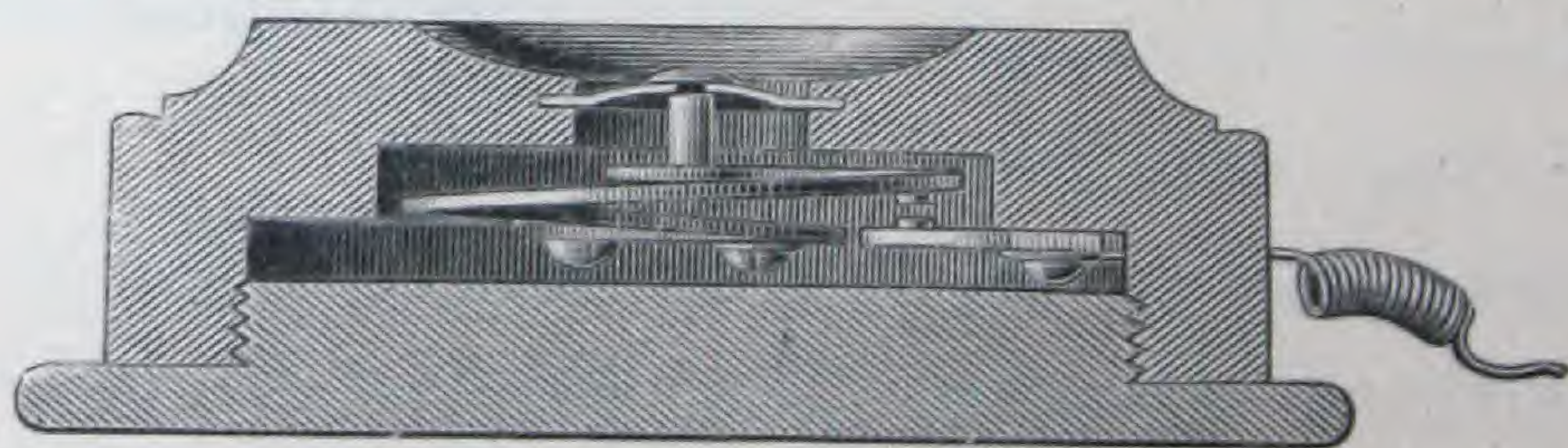


BACK VIEW OF CAP.

of thin sheet copper (No. 28 B. & S. gauge) expanded into the wood in recess, firmly fixed in position. The fusible solder seal, closing orifice in sensitive disk is the most fusible known permanent solder compound; softening at 145° F., and melting at 155° to 160° F. The interior is thoroughly sealed.

The details of Closed Circuit Thermostats are similar to the above, except the positions of platina points.

Where to Use.—The substantial form of this Thermostat allows its use in almost any position of danger—interior or exterior—on walls, ceilings, posts, floors, in closets, attics, garrets, cellars, out-houses, and out of way places, storehouses, hulls of vessels, heaps coal, lumber or inflammable material, lumber yards, planing mills, manufactures of all kinds, flour mills in every part, including granaries, dust rooms and flues, elevator heads and bolting chests. Anywhere that a fire is liable to occur is the proper place for a Thermostat, and any Thermostat that cannot be so used fails in its duty. Hill's Patent Electric Thermostat Fire Alarm can be placed in any position where an insulated wire can follow it. There is little danger of breakage or damage. It may be struck with a hammer, thrown



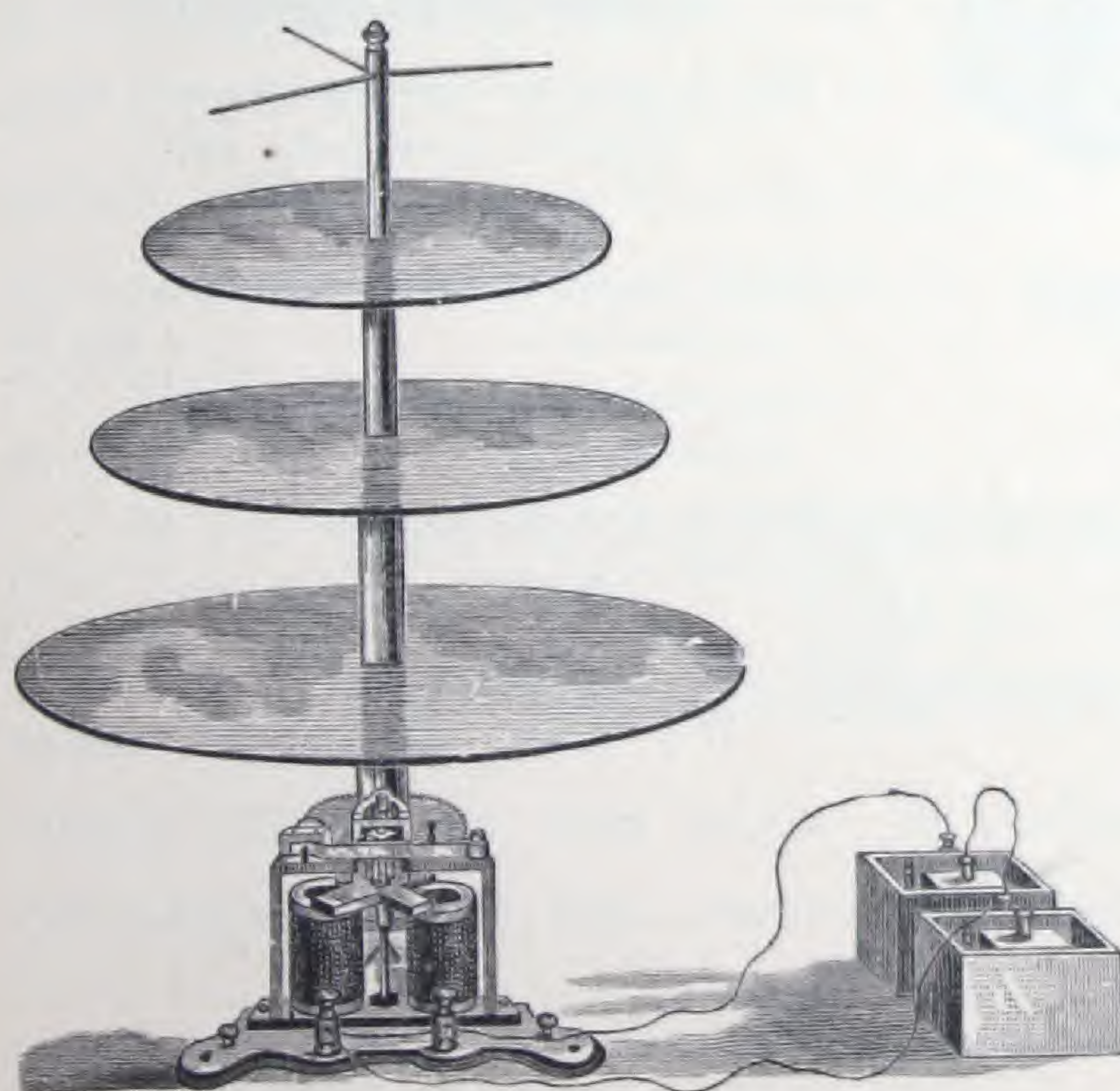
SECTIONAL VIEW.

fifty feet in the air and allowed to fall to the ground, or treated in any reasonable, rough manner, and afterwards it will be as efficient as before. It is proof against any ordinary hard usage, as well as the curiosity of the meddlers and of the small boy. Once placed on duty, it will be faithful to its trust until heat unseals it, when its action will be instantaneous, whether the time of call is in ten days or ten years.

Price.....50 cents.

PATENT ELECTRICAL TURNTABLE.

For Show Windows, Glass Cases, and for Exhibitions of Every Kind. The Best, Cheapest and Most Reliable Turntable in the Market.



No. 1 TURNTABLE

A FEW POINTS TO BE REMEMBERED :

1. Cost of running six months, \$3.00.
2. It needs no winding up of clockwork.
4. It will carry fifty pounds; can carry one hundred pounds by use of more battery.
5. Runs steady and uniform.
6. No necessity of support from the top; can be made any height.

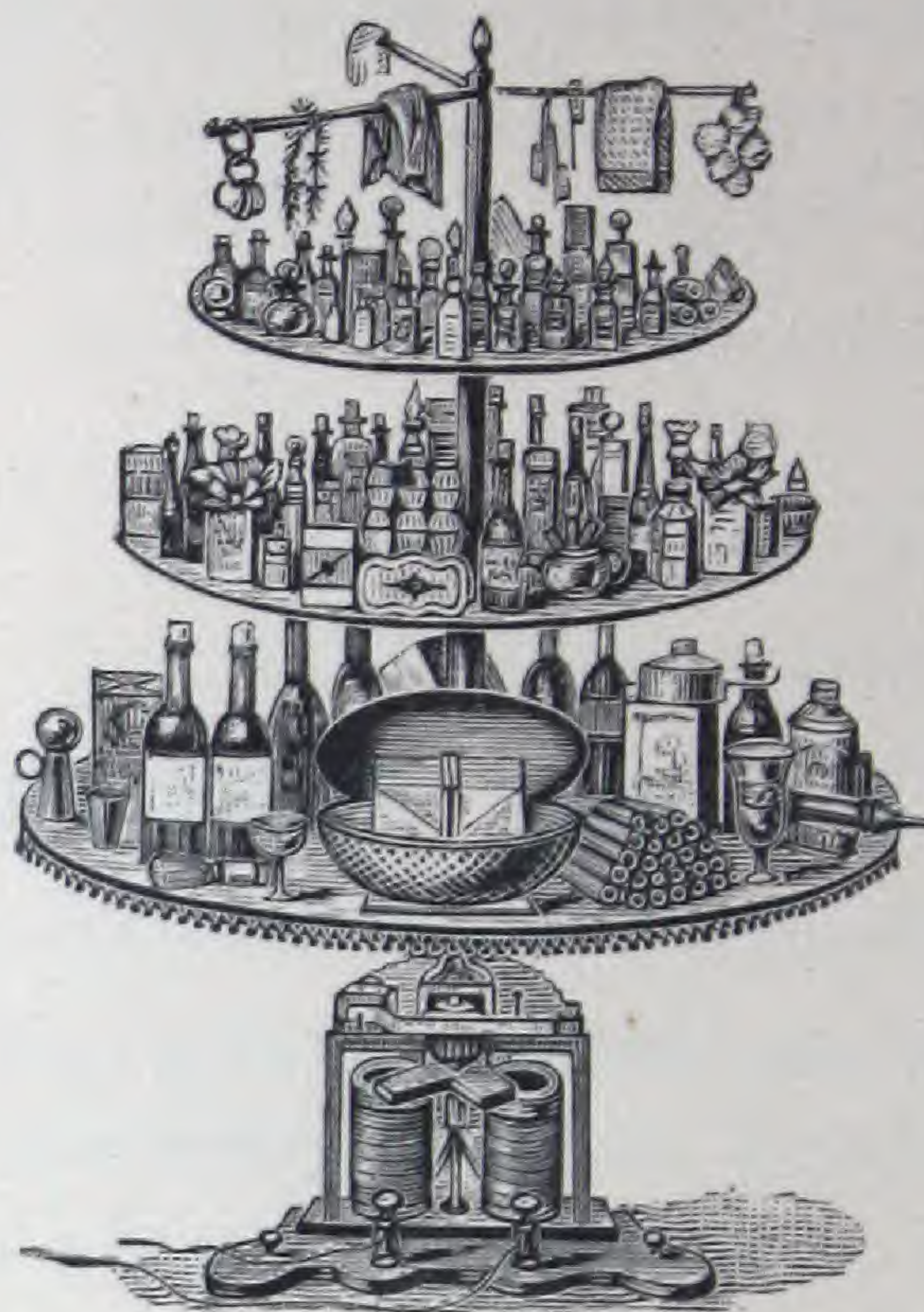
REVOLVING SHOW STAND.



No. 5, FOR JEWELRY.

Price, complete, with Pedestal....\$32 00

The pedestal is 8-sided, 36 inches high, and covered with velvet.



No. 1, FITTED WITH SHELVES FOR PERFUMERY, GLASSWARE, ETC.

Price, complete, 3 feet high, without shelves.....\$25 00

Glass Shelves, 12, 15 and 20 inches diameter 7 25

Velvet Shelves, 12, 15 and 20 inches diameter 4 00

We make to order other styles, such as Obelisk, Lighthouse and Steeple-shaped designs.

THE "LIGHTNING" BINDER.

For Binding Insulated Wires to Gas or Water Pipes.

This is a most convenient device, and one which will be readily appreciated by those who have occasion to run insulated wires along the outside of gas or water pipes.



It consists of a strip of spring brass, having a slit punched in one end. It is placed around the pipe and over the wire, the pointed end being drawn through the slit until the wire is firmly fastened. The strip is then bent over in the opposite direction, and with a tap of the hammer or plyers is secured and the end cut off. The wire is additionally tightened by pinching the binder against it with the plyers. This binder as applied is shown in the cut below.



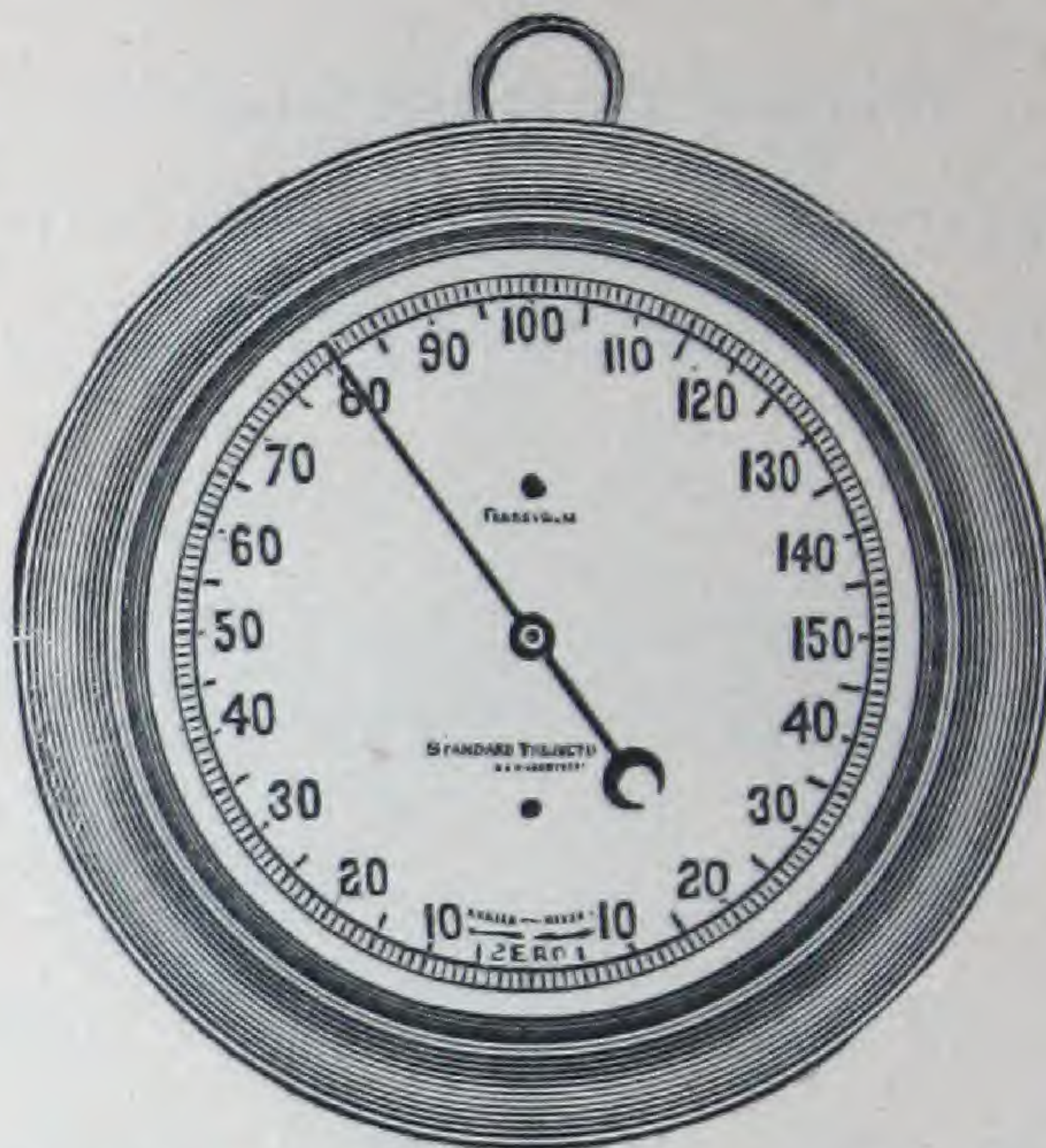
Price per gross..... \$2 00

Liberal discount to the trade.

THE STANDARD THERMOMETERS.

ACCURATE. ORNAMENTAL. LEGIBLE. DURABLE.

The Standard Thermometers give a new method of determining the temperature, and have the high merit of great accuracy. The Dial with its distinct graduation, and plain numerals, is as legible as any clock dial of the same size. Constructed of material not affected by dust or dampness, they are thoroughly durable.



They admit of a variety of treatment in size and style of mounting, and the most simple is ornamental, as well as substantial. The Fahrenheit scale is used, and the greatest care taken to accurately adjust each instrument. They are carefully tested before they are allowed to leave the hands of the manufacturers, and are warranted to indicate the temperature with accuracy, and sustain their claim as the standard thermometers.

For use in Dwellings, Offices, Schools, Churches, Asylums and Hospitals, and in Hotels, Mills, Factories, Warehouses, Markets, Engine Rooms, Ships, and in all places where reliable instruments are wanted, they are the easiest Thermometers to read and are therefore the most desirable.

Each instrument is registered and a record kept of the test.

Awarded silver medal at Exhibition of the Massachusetts Charitable Mechanics' Association, Boston, 1884.

MOUNTED IN BRONZE, BRASS AND EBONY CASES.

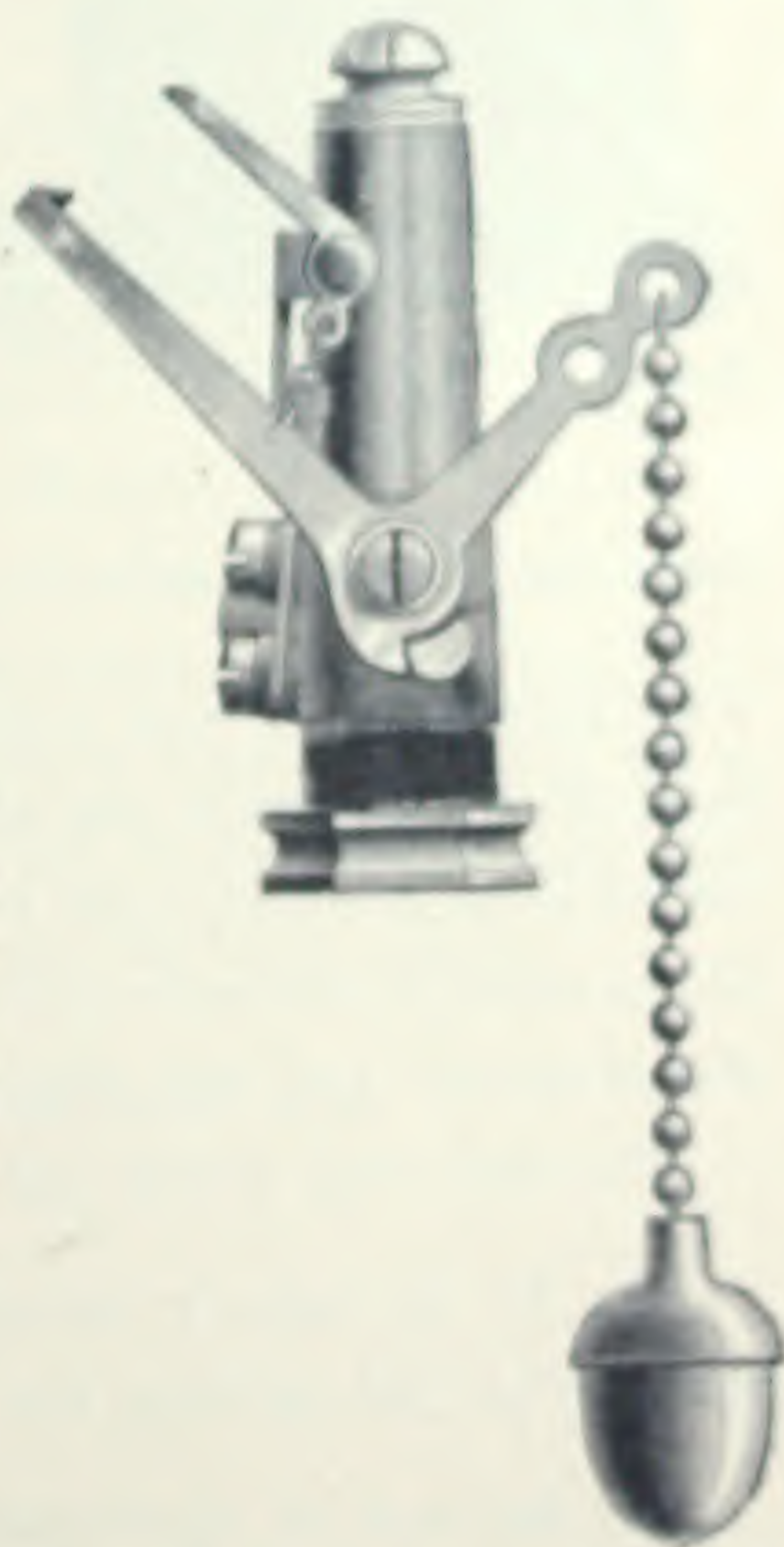
Price, No. 1, dial five inches in diameter.....	\$3 00
" " 2, " eight " "	4 00

AN INCANDESCENT LAMP may be used with these thermometers when placed on a post out doors, the battery and switch being in the house. By this arrangement the true temperature at night may be read from the house by turning on the light by means of the switch. The battery will need no attention oftener than about once a month.

A battery, 2-candle lamp, reflector, switch and 40 feet of double wire
for this purpose will be furnished for\$12 00

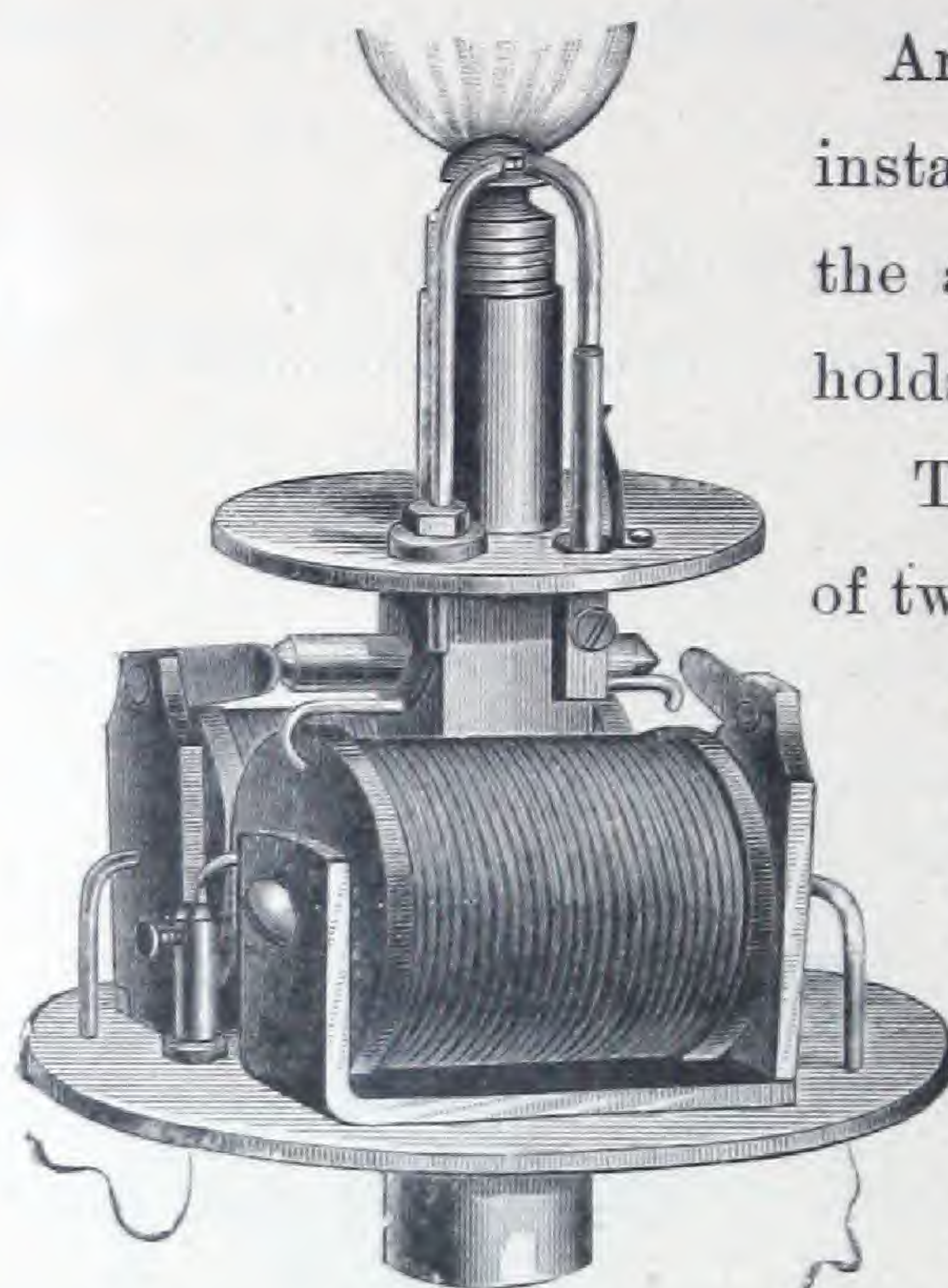
ELECTRIC
GAS LIGHTERS.

Plain Pendant or Pull, Brass,.....	\$0 60
" " " " Nickel Plated,	75
Billiard Table Pendant Burner.....	1 00
Hatchet Pendant or Pull.....	1 50
Argand Burner.....	3 25
Fixed Arm Burner.....	1 25



GAS LIGHTING AND EXTINGUISHING BY ELECTRICITY.

Adapted to Dwellings, Flats, Stores, Windows, Hotels, Theatres and Churches,
wherever Gas is used.



PATENTED

May 31, 1881. May 2, 1882. April 25, 1882.

Among all the methods in use for the instantaneous lighting of gas, without the aid of matches or tapers, electricity holds the most prominent position.

The system for private houses consists of two parts, the Automatic and Pendant.

By the Automatic, the gas is turned on, and lighted or extinguished, from one or more convenient points, by ivory push buttons, set in handsome hard woods to match the trimming of the room. For instance, a most convenient place for an Automatic Burner is in the front hall,

with buttons in several places, say near the front door, at the head of the stairs, in the sitting-room, library, etc., and from any one of these points the gas can be instantly lighted or extinguished. Other usual locations for Automatic Burners are in the upper halls, the chambers and the cellar, with buttons at doors or bedside.

The following points are claimed for this Burner:

1st. It is entirely automatic or self-acting; one operation turning on and igniting the gas or extinguishing it.

2d. Its ease of application to ordinary gas fixtures.

3d. Its simplicity of construction and arrangement; having no complicated parts liable to get out of order.

4th. Its saving of gas; as no lights need be kept burning where it is in use; the mere pressure of an electric button lighting the gas wherever needed.

5th. Its removal of a fruitful cause of fires by dispensing with the use of matches,



“THE SELF-LIGHTER” IN OPERATION.

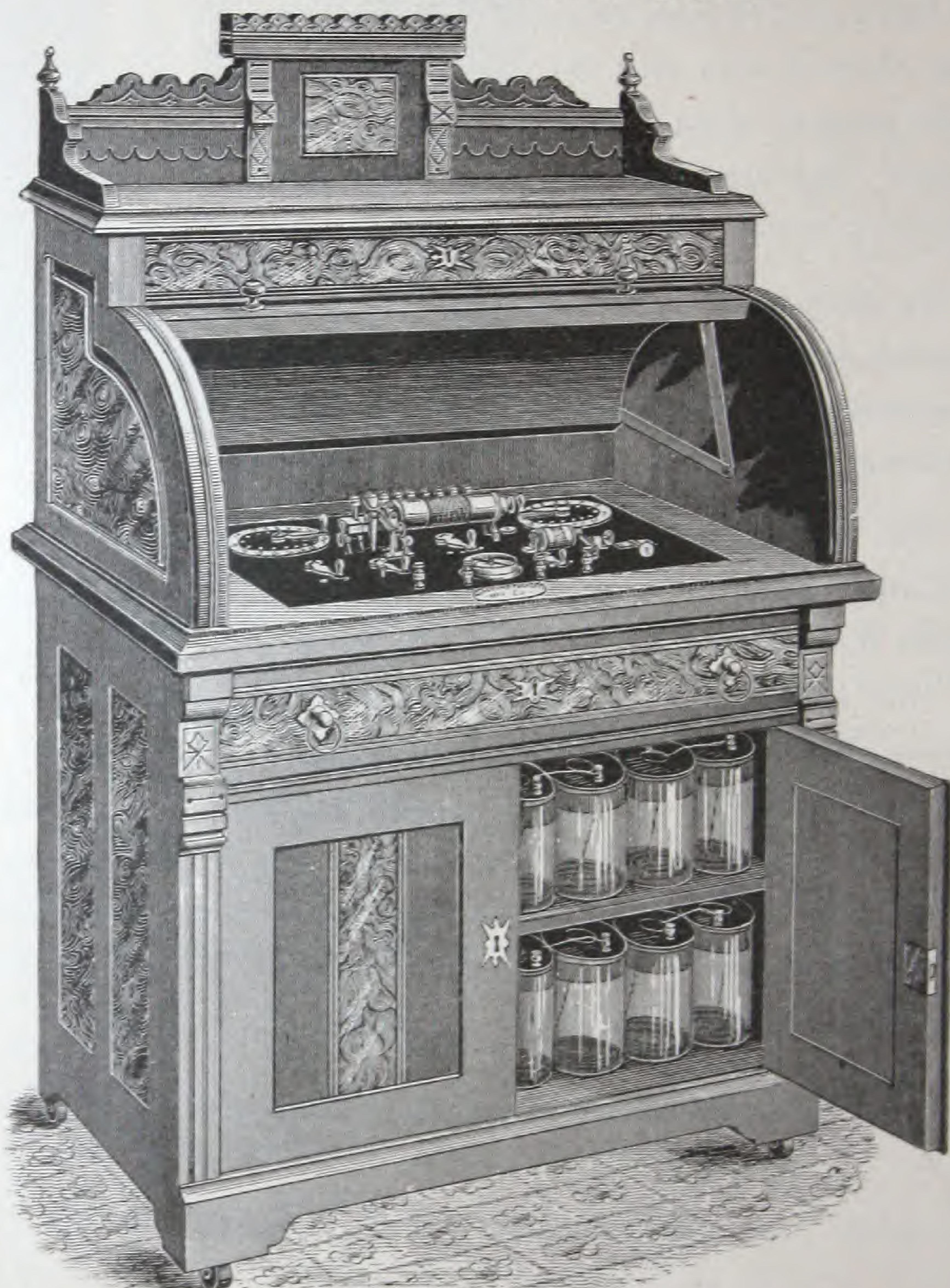
6th. In dispensing with the ordinary ground-in gas cock, thereby avoiding friction and securing reliability and instantaneous action under the electric impulse.

The introduction of this apparatus into private residences causes no inconvenience to the family or injury to the property as all wires are laid in concealed spaces by hands skilled in electric work, while the battery, which is enclosed in a neat box 9x15 inches, can be located in a closet or other convenient place, where a small space can be spared, as it emits no disagreeable or offensive odor, and it needs attention but once or twice a year.

AUTOMATIC GAS LIGHTERS, EACH, \$7.50.

MEDICAL BATTERIES.

CABINET COMBINATION BATTERY FOR HOSPITAL USE.

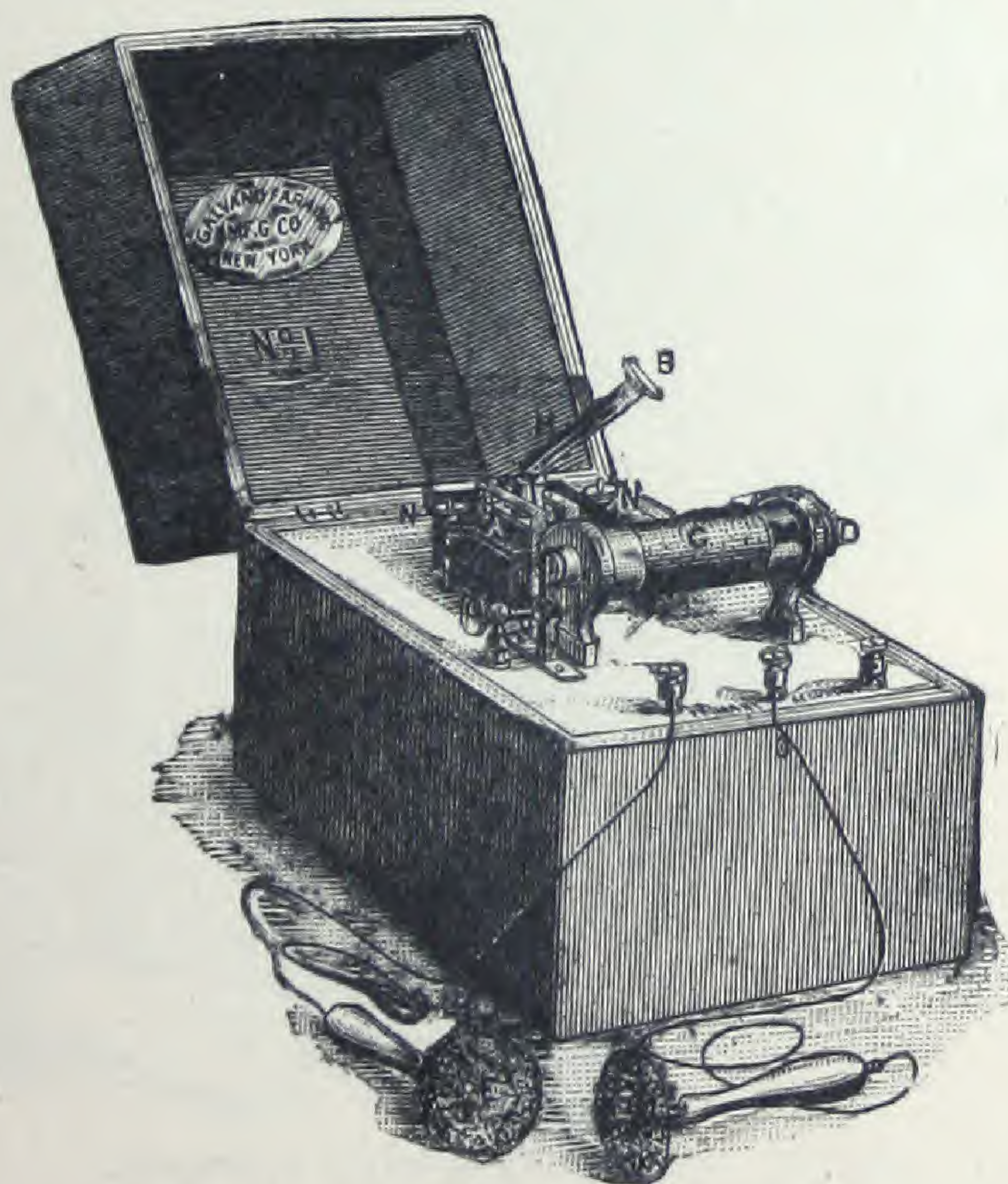


Price, 60 cells	\$250 00
" 40 "	200 00

The above engraving represents the new and greatly improved Cabinet Combination Galvanic Battery, of sixty cells and accessories. This convenient and complete apparatus is constructed more especially for physicians of large office practice, and for Hospital and Dispensary use. *The batteries are constructed for great durability, power, and require but little attention in their management.* The cost of keeping in order is nominal. The accessories, consisting of current selectors, commutators, rheotomes, and faradic coils, are of the most approved style.

The Cabinet is of black walnut, and of neat design, and for convenience is placed on castors.

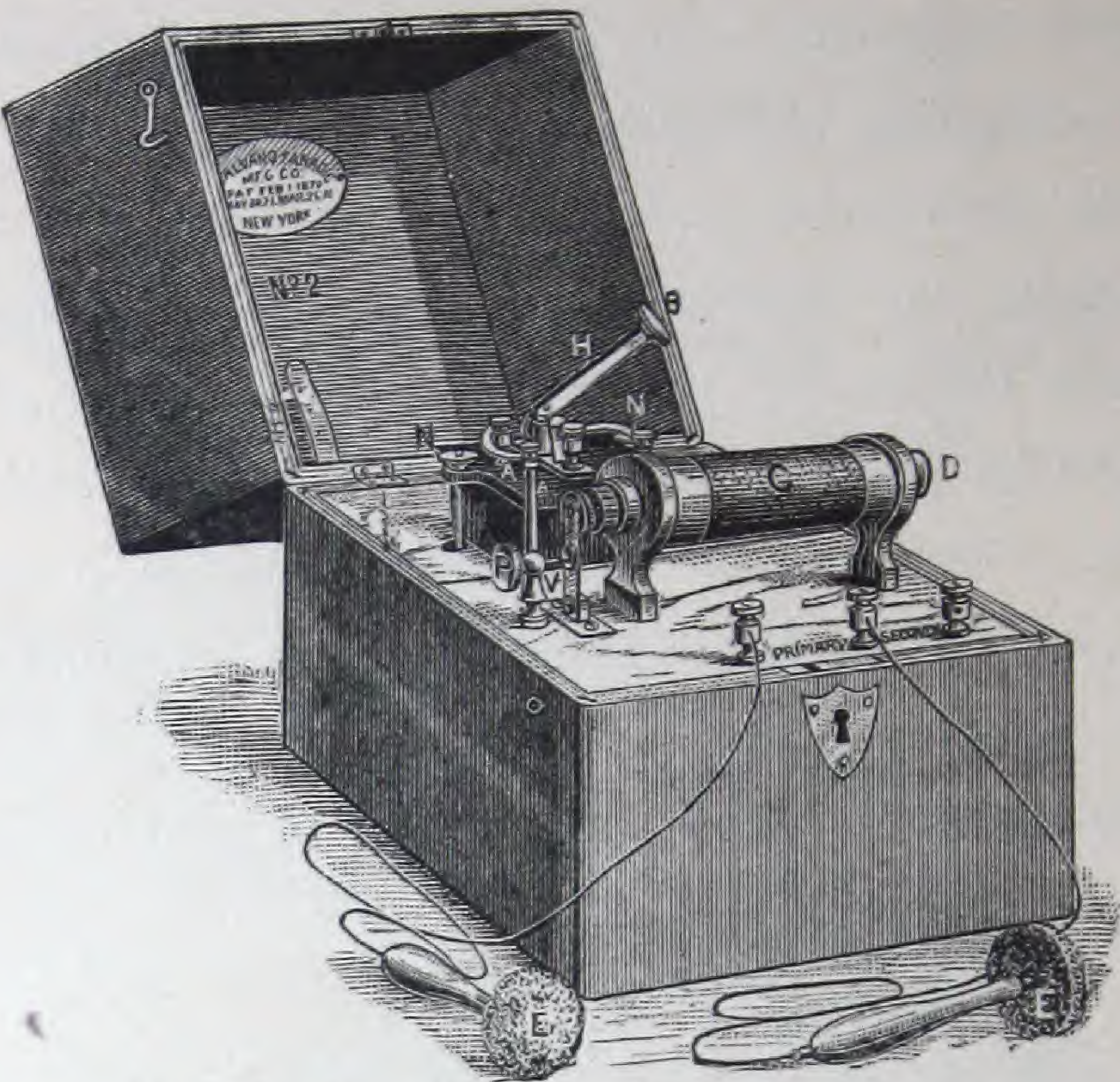
ELECTRO-MAGNETIC MACHINES.



No. 1. SMALL, FOR FAMILY USE.

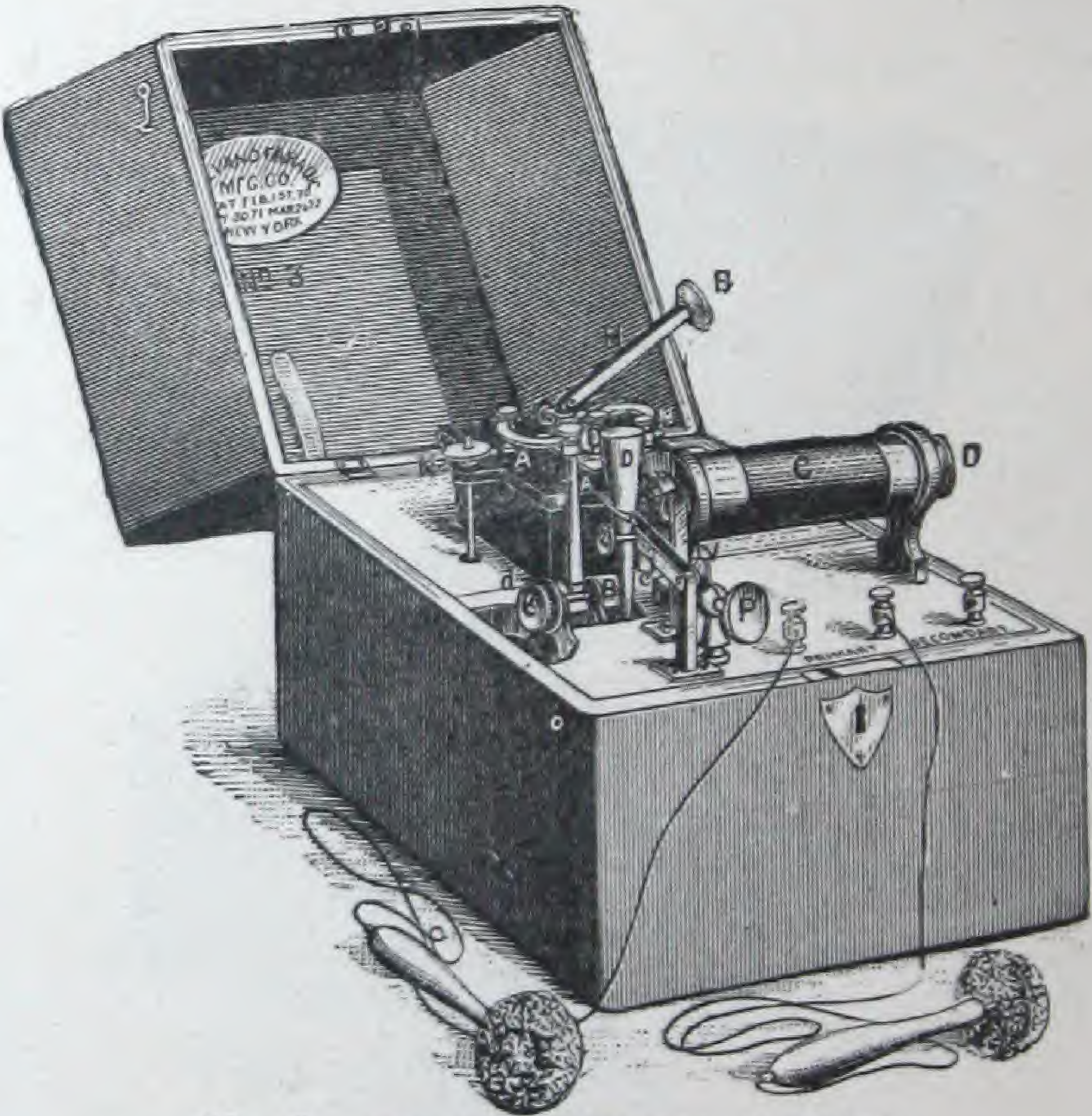
Price.....\$10 00

This instrument is very simple and convenient.



No. 2. MEDIUM, FOR FAMILY USE.

Generally ordered by Physicians for patients.....	\$15 00
Hard, rubber cell, extra.....	1 50

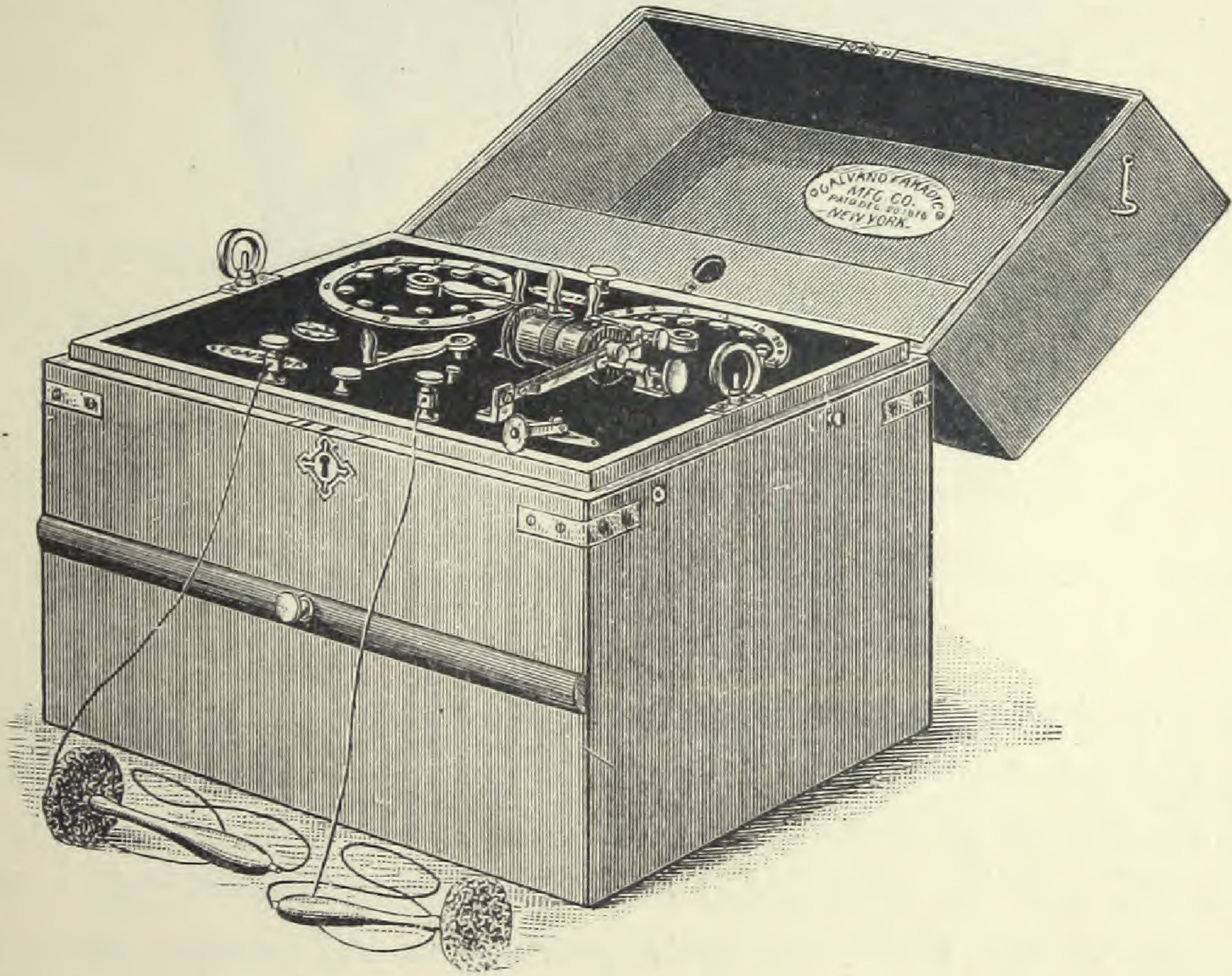


No. 3. FOR PROFESSIONAL PURPOSES.

Nickel-plated	\$20 00
Hard Rubber Cell, extra.....	1 50
Double-Cell Battery.....	35 00
Hard Rubber Cells, extra	3 00

16-CELL COMBINED GALVANIC and FARADIC BATTERY.

Sixteen Cells.....	\$45 00
Twenty-four Cells.....	60 00



36-CELL GALVANIC BATTERY WITH RHEOTOME ATTACHMENT.

Price.....	\$80 00
------------	---------

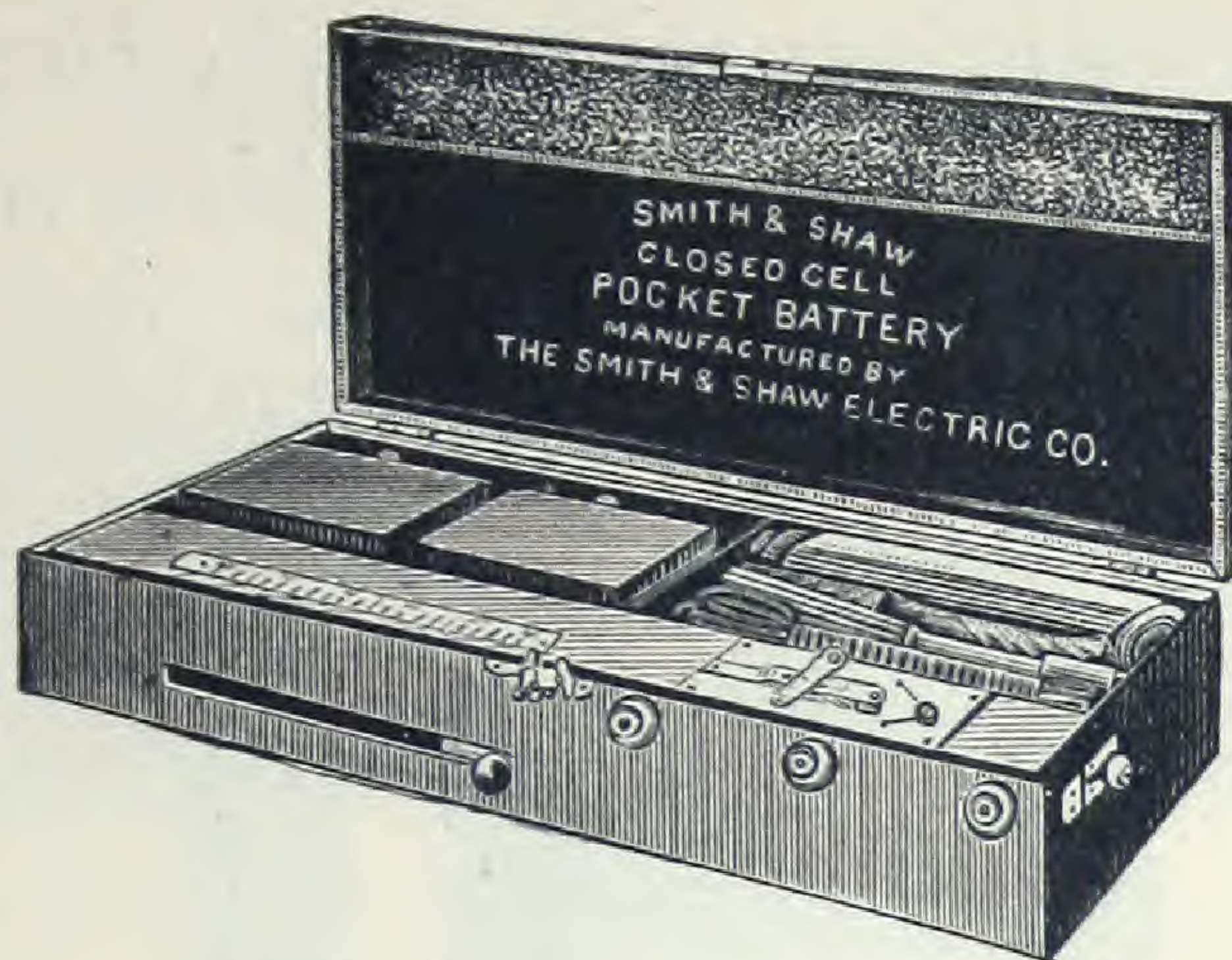
THE PHYSICIANS' HANDY CABINET BATTERY.



PRICE, \$100.00.

The accompanying cut represents a light and compact form of Cabinet Battery, which has been manufactured from drawings and suggestions furnished by Prof. Ambrose L. Ranney. It is on castors, and can be wheeled about the consultation room. This admits of the use of the instrument when the patient is in the gynecological chair or upon the office lounge; or when any form of fixed apparatus, such as the laryngoscope, the inhaler or spray, etc., it being simultaneously employed. In some of the later models an immovable tray is placed beneath the battery for electrodes, and a movable shelf is also provided upon which a milli-ampere-meter, the solution of table salt, and the electrodes in actual use can be set. Two feet eight inches high, twenty-three inches long, fifteen inches wide.—*See New York Medical Journal, July 11th, 1885.*

THE CLOSED CELL MEDICAL POCKET BATTERY.



Combining improvements of so radical a nature as to make it *The Pocket Battery* of the age.

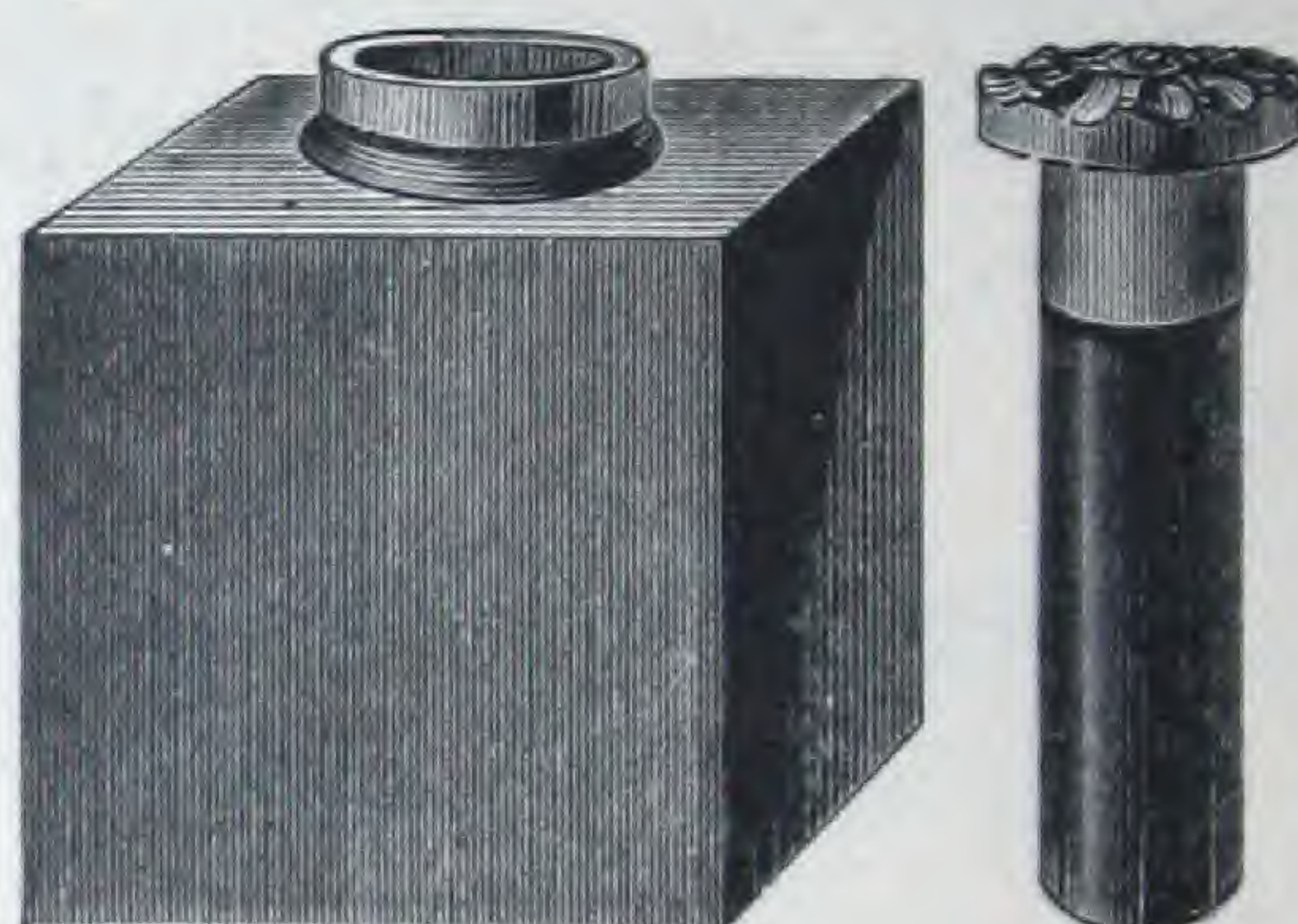
Battery No. 1 is 6 inches long, $3\frac{1}{2}$ inches wide, and $1\frac{1}{2}$ inches high. Outside measurement.

Battery No. 2, $7\frac{1}{8}$ inches long, $3\frac{7}{8}$ inches wide, and $1\frac{1}{2}$ inches high. Outside measurement.

These sizes will admit of their being comfortably carried in the pocket. They weigh from $\frac{7}{8}$ to $1\frac{1}{8}$ lbs. respectively. The largest one is not as heavy as many a bunch of keys. The "cells" are absolutely air-tight and acid-tight, thus enabling the operator to carry the battery in any position, charged and ready for immediate use.

These batteries have a current so mild that it cannot be felt excepting by the most sensitive, and yet be gradually increased to one so strong as to fully meet the requirement of any medical demand. The disagreeable jerk or electric "thump," so characteristic of many batteries, is not found in these, but a current that is

nowhere excelled for its fineness, smoothness and agreeableness. The cell will give ten to twelve hours' work, and can be used from day to day, until that much electric energy is consumed, upon a small charge of bi-sulphate mercury. The Pole Cords are attached on the outside of the box; the Graduator is outside, most handily placed, and cannot fall out; the "Cut-off" for "making" and "breaking" circuit is also outside. The boxes are mahogany or black morocco. The induction coil, of best copper wire, carefully wound by skillful hands, and properly proportioned to produce the best effect.



The Cells are of hard rubber with carbon chamber, charged with a solution of bi-sulphate mercury, into which a zinc rod is immersed. The zinc rod has a rubber head fitting tightly into the neck of the cell, making the whole air tight and acid tight.

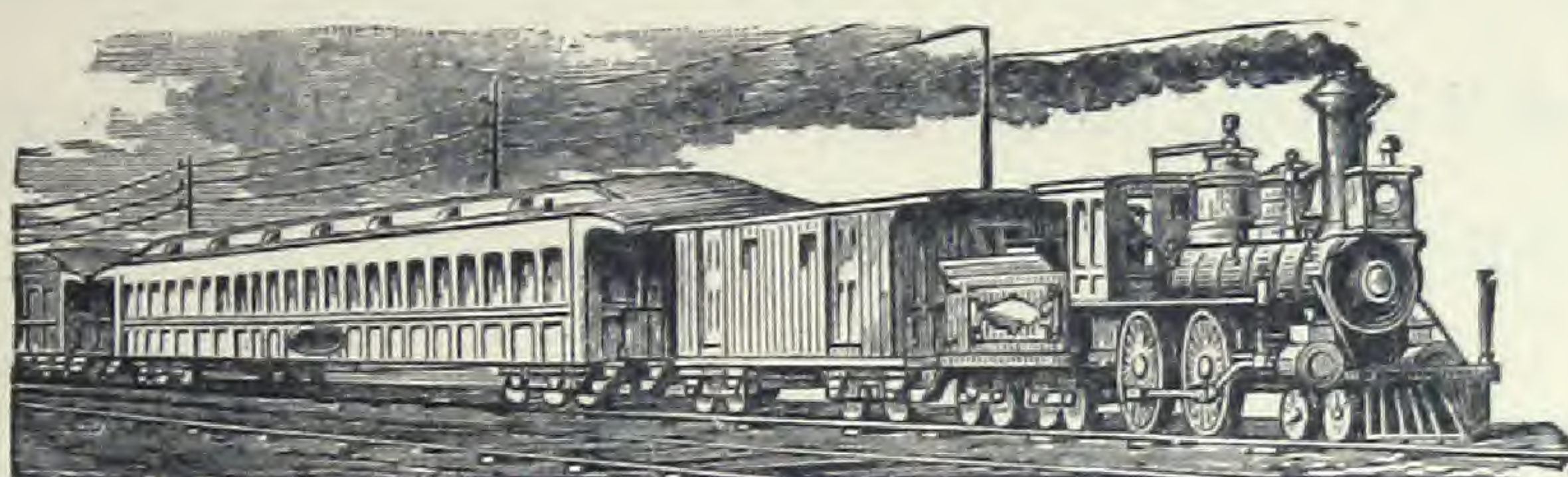
The Rheotome is made on an improved plan, and is not liable to get out of order. The Pole Cords, Hand Electrodes, Wire Brush, and Olive and Spherical Electrodes are of the best material and workmanship.

Price, Mahogany or Morocco Covered Box, No. 1.....	\$7 50
“ “ “ “ “ No. 2.....	10 00
“ Parts, Cells.....	1 50
“ “ Zinc Rods, with stopper.....	25
“ “ Pole Cords, per pair.....	75
“ “ Mercury, per oz., 10c. per lb.....	1 25

Sent by Mail or Express, PREPAID, on receipt of price.

ELECTRIC TOYS.

THE ELECTRIC EXPRESS.



A COMPLETE MODEL ELECTRIC RAILWAY.

While this railway is in the nature of a toy, it is practically a scientific apparatus, showing how electric power may be applied for propulsion of a train, and is especially valuable as a most instructive and pleasing gift to a boy, for experiments and practical illustrations of the motive power of electricity.

The complete outfit consists of a locomotive, arranged with an electric motor for driving, two cars, twelve feet of track, arranged in a circle of four feet diameter, a powerful battery and the necessary conductors. The locomotive is 6 inches in length, and the gauge of the track is $2\frac{1}{2}$ inches. The track is in eight pieces, with joints by which it may be put together in a few seconds. The battery is very simple in construction, easily understood, and may quickly be put in operation. When the connections with the battery are made, the train will at once start off and run for about three hours, if desired, on one charge of solution.

This apparatus is made with the utmost simplicity, with a view of avoiding any chance of its getting out of order, and will, if used with ordinary care, last for years. It cannot fail to be a most

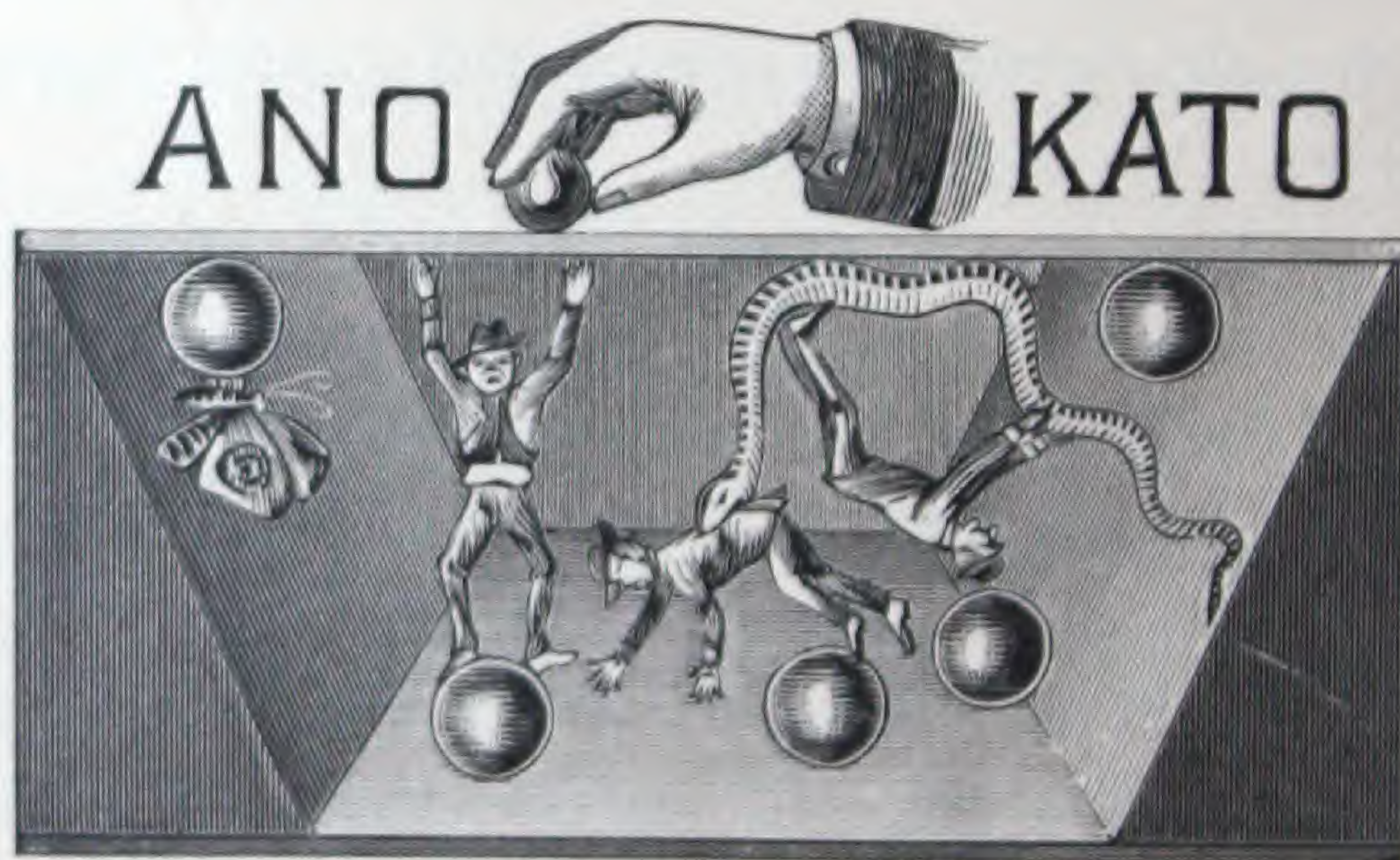
acceptable present to a boy, and will afford practical information and amusement. It pleases both old and young.

FOR SHOW WINDOWS we can confidently recommend it to storekeepers who desire to have something which will at once attract the public attention, especially at this time, when commercial electric railroading is being prominently brought out.

Price of the "Electric Express," complete, with battery, packed.....\$8 50.

An Edison 6 candle lamp may be lighted with the same battery, and will be sent for \$1.50 extra.

THE NEW ELECTRIC TOY.



The best recent novelty in the toy-line. Useful to the student in Electricity, and a source of never-ending entertainment to the young and old. Scientific and amusing.

The above cut represents the toy in operation. The figures are jointed, and men, snake, butterfly and balls move rapidly up and

down, and form curious attitudes and combinations. It cannot get out of order, and will last for years. It is enclosed in a neat box with a sliding cover, and can be sent by mail or express. It sells largely among toy-dealers, as well as dealers in notions, fancy goods, druggists' supplies, stationery, optical and electrical apparatus, etc., and country stores.

NOTE.—Keep glass clean and dry. If the figures do not act readily, rub a little amalgam, contained in small box, upon the surface of the glass, or dry off by gentle heat.

Price.....75 cents.

LIBERTY ENLIGHTENING THE WORLD.



We will mount lamps of any candle power in the miniature reproductions of Bartholdi's great statue of "Liberty Enlightening the World," which are now being sold by the Statue Committee. If desired, we will purchase these statues for our customers, and mount a lamp in the torch, as shown in the engraving. The price of the statues ranges from one dollar upwards—one measuring twelve inches in height, from the foot of the pedestal to the torch, and made of bronze and nickel, costing five dollars.

The price of mounting any size of lamp from $\frac{1}{2}$ to 6 candle power, including lamp and flexible conductor, \$3.00.

For batteries to run these lamps see our "B" Battery, page 19.

THE "STAR" POCKET BATTERY AND ELECTRIC LIGHT SCARF PIN.



The battery and scarf pin represented in the engraving is one of the most taking electrical novelties ever put on the market. The battery (a primary one) is four inches long, four inches wide and three-quarters of an inch deep, of a size suitable to fit in any pocket.

It contains two cells and is made of

polished hard rubber, with carbon and zinc elements. The lamp is mounted on a silk covered cord, running underneath the clothing, and connected on the cord is a push button which, when pressed, makes a complete circuit, causing the lamp to light up brilliantly to $\frac{1}{2}$ -candle power. The lamp, an Edison Incandescent one, is mounted on a scarf pin and may be worn in the necktie or elsewhere as desired.

The most sensational and amusing effects may be produced by this scarf pin, bewildering and surprising those who are not in the secret, as there is nothing apparent which would indicate the manner of producing the light.

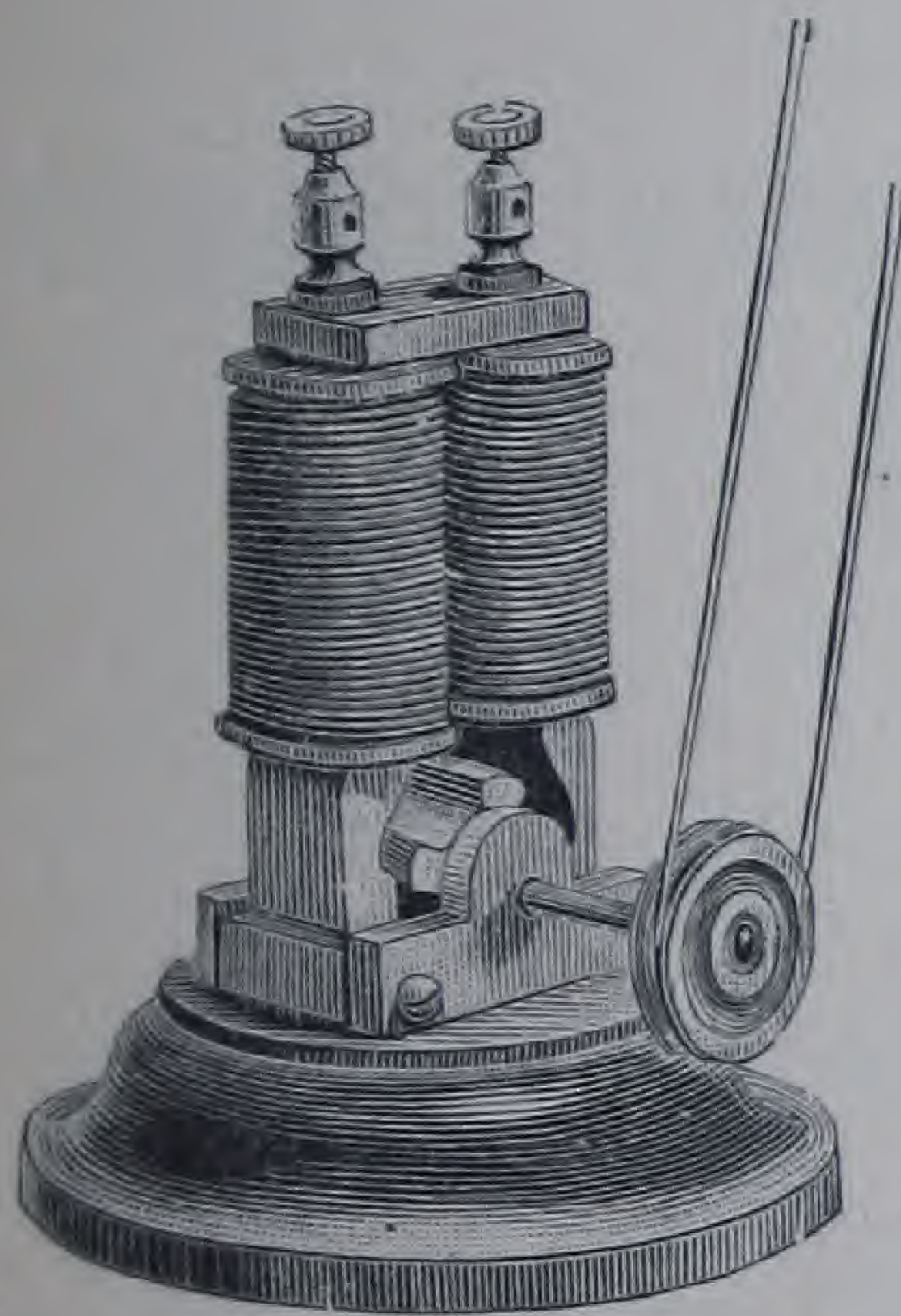


PRICE LIST.

Price, complete	\$5.00
Pocket Battery alone.....	3.00
Scarf Pin and Cord alone.....	2.50

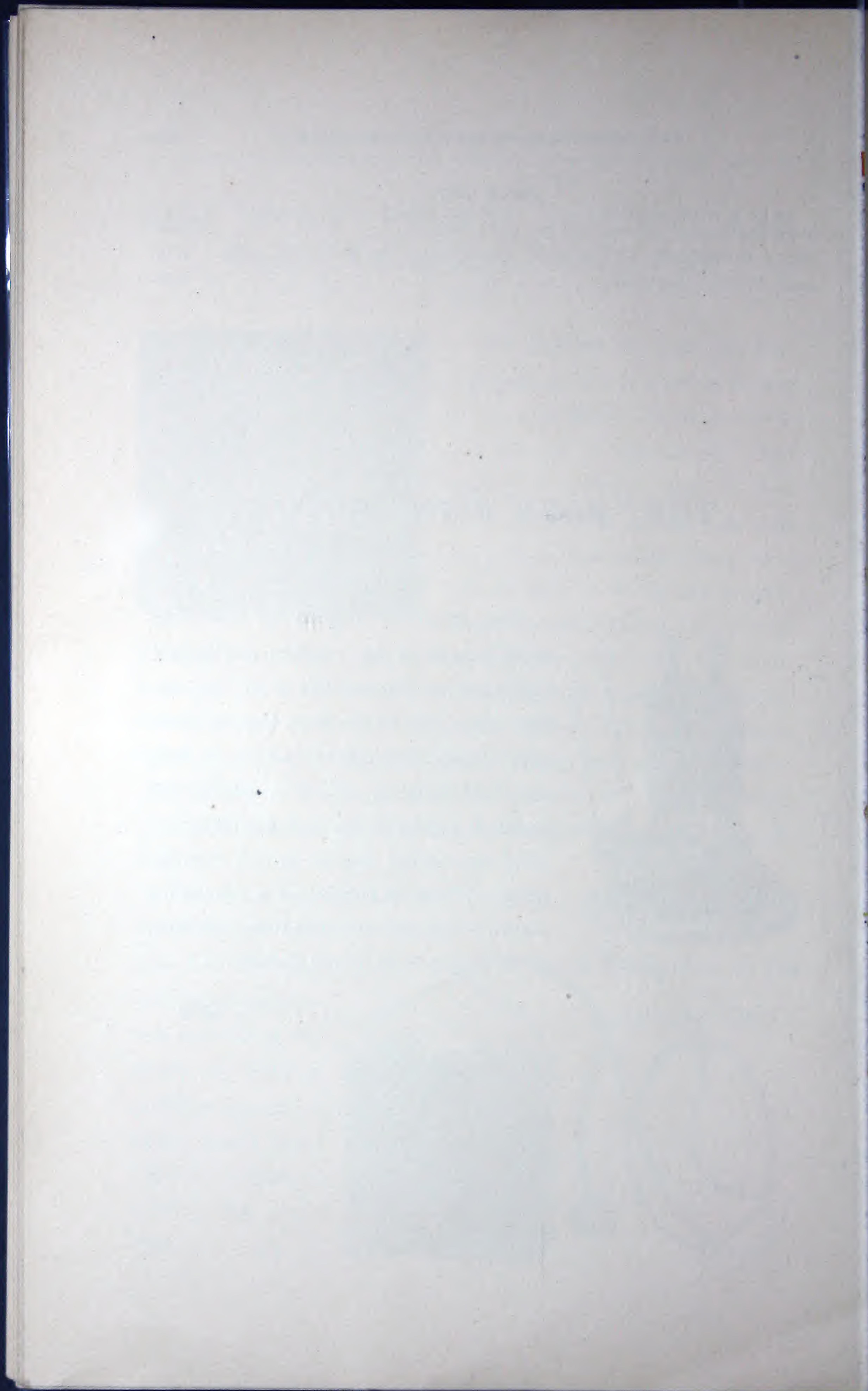


THE "BOYS' OWN" MOTOR.



This motor is adapted for operating small pumps or for running mechanical toys, such as blacksmith's shop, etc., etc. The motor may be run from two or three cells of any bichromate battery or from our "B" battery. It is a useful and practical toy for boys, as important electrical knowledge may be gained from its study. There is nothing of a dangerous nature connected with this little machine, and its workings will be sure to please both young and old.

Price, without battery.....	\$5.00
-----------------------------	--------



THE TELEMETER SYSTEM

For Continually Indicating and Permanently Recording
Temperature or Pressure at
Distant Points.

TELEMETRY SECURES "A WATCHMAN THAT NEVER SLEEPS."

IMPORTANT FOR
MANUFACTURING AND OTHER INDUSTRIES,
ALSO, FOR OCEAN STEAMERS,
AND
THE NAVAL AND SIGNAL SERVICE.

ABSOLUTELY RELIABLE—EVERY INSTRUMENT GUARANTEED.

THE TELEMETER SYSTEM.



The Telemeter System comprises instruments for the following purposes :

1. The Telemanometer, for continuously indicating and permanently recording the pressure of steam at a distant point.

2. The Telethermometer, for continuously indicating and permanently recording the temperature at any distance.

3. The Telehydrobarometer, for continuously indicating and permanently recording the heights of water in reservoirs, storage ponds, rivers, lakes, dams, tanks, etc., at any distance.

Each of the above consists of two separate instruments, viz., a transmitter, which is located where the pressure, temperature, or height is to be taken ; and the receiver, which is located where the indication is desired, whether the distance be yards or miles. The instruments are operated by a battery of Prism Leclanché cells, located at the latter point. The battery is of the same kind as is used on telephones, call bells, burglar alarms, etc., and requires no attention.

The receiving instrument contains an alarm bell, and on the dial are two alarm hands for maximum and minimum limits. These hands can be set at any two points, and the alarm bell will ring automatically if these points are obtained or exceeded.

The wires may be run by local electricians according to diagrams furnished by us, or we will send our own wiremen to install the instruments at the purchaser's expense.

Every instrument, when conducted according to our diagram, will be **GUARANTEED**. Especial pains have been taken in perfecting these instruments ; to provide them with parts which do not wear out or need renewal.

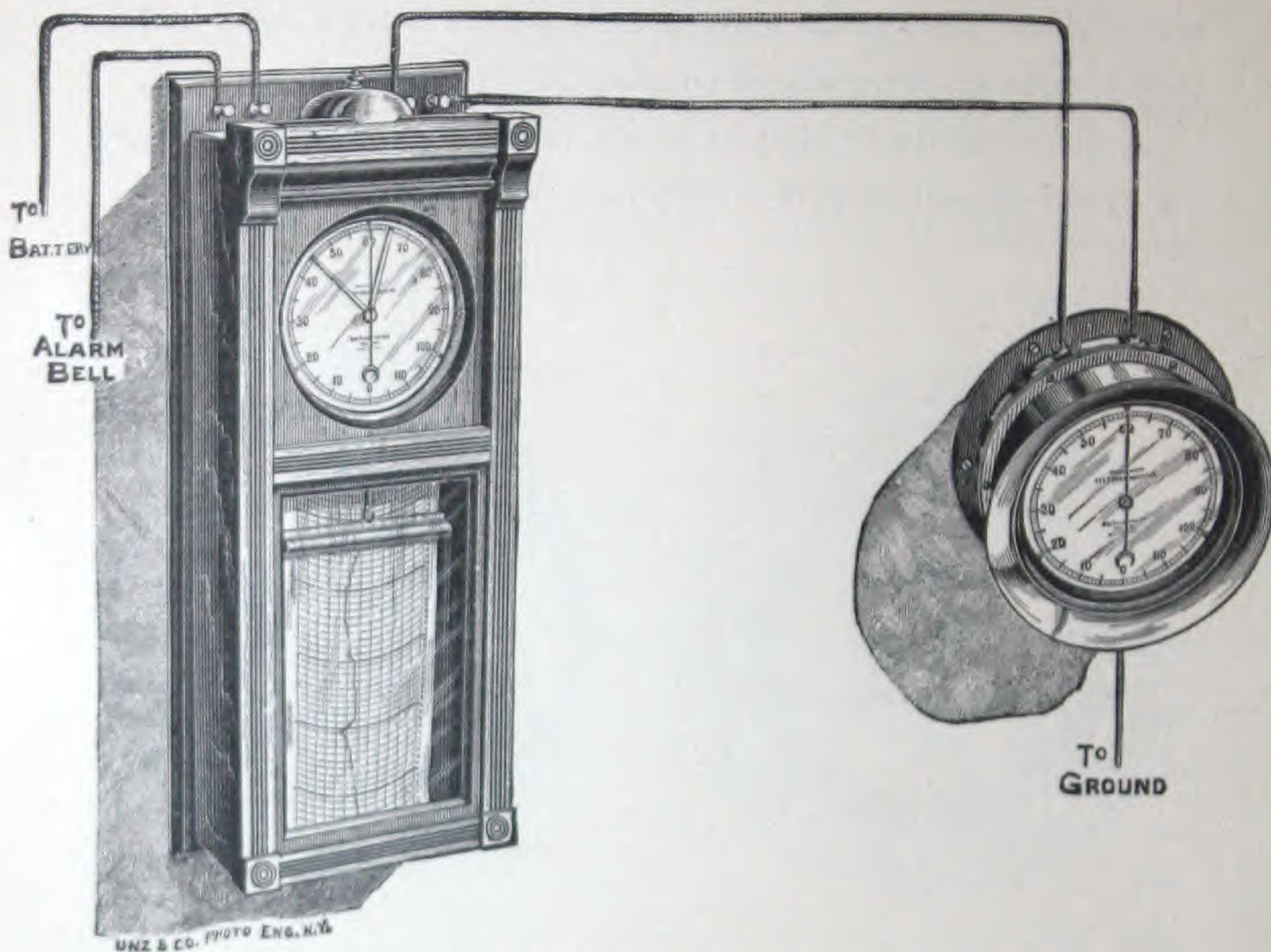
The instruments comprising the Telemeter System have had upwards of two years of the severest tests before being offered to the public, and can, therefore, be confidently recommended.

A silver medal and diploma were awarded for the Telethermometer by the MASSACHUSETTS CHARITABLE MECHANIC ASSOCIATION.



THE TELEMANOMETER.

FOR INDICATING AND RECORDING STEAM PRESSURE AT A DISTANCE.



"A WATCHMAN THAT NEVER SLEEPS."

Secured by Letters Patent in the United States and Europe, by ROBERT HEWITT, JR.,
and CHARLES L. CLARKE.

For the convenience and practical information of steam users this instrument is of the greatest value. Not only may the steam pressure at one mill or factory be indicated and recorded at a point, distant or otherwise, but the pressure at any number of mills or factories may all be indicated and recorded at the same point, thus enabling a superintendent, having charge of several establishments,

to be positively informed what steam is being carried at each place. The records made by this instrument are indelible and may be preserved for years, and, showing the pounds of steam at each minute of the day or night, and form a valuable reference.

This instrument is especially valuable to steam-heating companies, as it enables them to have the pressures of all parts of a steam-distributing system indicated and recorded at a Central Station.

The alarm hands may be set at a minimum or maximum pressure, either of which, when obtained, causes the alarm bell to ring automatically and call attention to the fact.

Price of Telemanometer (range 200 lbs. in intervals of 2 lbs.).....	\$125.00
Battery for same.....	9 00

The following testimonial has been received from Wm. D. Marks, Professor of Mechanical Engineering in the University of Pennsylvania, relative to the performance of one of our Telemanometers for indicating and recording steam pressures at a distance.

It was used in connection with an important test, made under the direction of the Franklin Institute, to determine the life of incandescent lamps, made by the several electric light companies.

The testimonial, coming as it does from a prominent engineer, is the strongest proof of the accuracy, reliability and value to steam users which we claim for this instrument.

“INTERNATIONAL ELECTRICAL EXHIBITION BUILDING,

“PHILADELPHIA, MAY 25, 1885.

“THE TELEMETER COMPANY:

“*Gentlemen*—We have finished using the Telemanometer which you erected to connect our Chief Engineer's room with the Boiler Room. It was indispensable that our steam pressure should be kept very closely within limits, and your instrument has performed its task of recording the pressures and of giving alarm on any noticeable variation from the required pressure during the past 1,000 hours without any accident or failure.

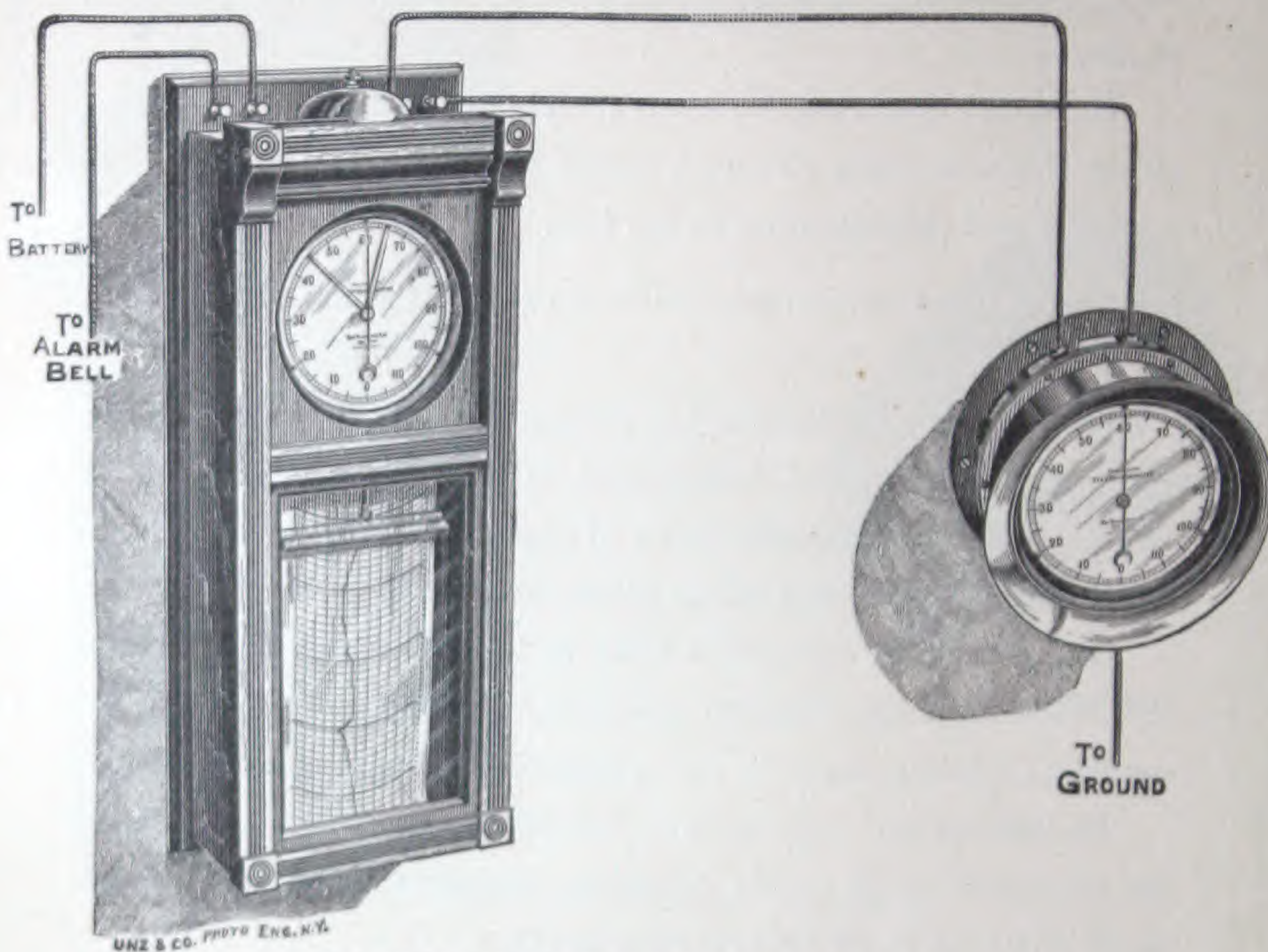
“I am very truly yours,

“WM. D. MARKS,

“*Chairman Executive Committee.*”

THE TELETHERMOMETER.

For Indicating and Recording Temperature at any Distance—Indispensable to all Industries where Temperature is a Consideration.



"A WATCHMAN THAT NEVER SLEEPS."

Secured by Letters Patent in the United States and Europe, by ROBERT HEWITT, JR., and CHARLES L. CLARKE.

The Telethermometer indicates continuously and records permanently the temperature of a distant point. It gives, at all times, to the management of manufacturing and other industries a complete knowledge and control of the temperatures throughout an entire establishment.

The instrument is of great value in many of its applications, and will be found invaluable in

BREWERIES,
MALT HOUSES,
DISTILLERIES,
OIL, SUGAR and other
REFINERIES,
COLD STORAGE WARE-
HOUSES,
PACKING HOUSES,
ABATTOIRS,
MARKETS,
REFRIGERATORS,

WINE VAULTS,
COTTON and WOOLEN
MILLS,
OIL CLOTH FACTORIES,
CHEMICAL, GLUE and
DYE WORKS,
DRYING and SEASONING
ROOMS,
GREENHOUSES,
GRAPERIES,
INCUBATORS,

GRAIN ELEVATORS,
VULCANIZERS,
JAPANNERS,
In the HEATING of
HOTELS, HOSPITALS,
ASYLUMS, SCHOOLS,
CHURCHES and PUBLIC
BUILDINGS,
And especially in the
VENTILATION of MINES.

Naval and Signal Service. The Telethermometer, for taking deep sea temperatures; in its application to the Naval and Signal Service, for obtaining, at all seasons, the temperatures at high altitudes and in uninhabitable places; and for all meteorological and scientific purposes, places in the hands of Government officials and scientists an invaluable agent to assist them in their researches.

Ocean Steamships. By indicating on the decks of ocean steamers the temperature of the sea water, it largely adds to the safety of navigation on the North Atlantic, and placed in the holds of steamers and in cars, transporting perishable freight it becomes a means for preventing loss or damage.

Automatic Fire Alarm. By its use, the heating of cargoes is instantly detected and located, and spontaneous combustion, the great danger in the coal-carrying trade, is prevented. Applied as an Automatic Fire Alarm, it continuously indicates and records at fire headquarters the temperatures in warehouses containing valuable merchandise, and rings an alarm at any desired temperature. It thus affords an additional protection at night to

mills and factories by notifying a manager or superintendent at his home of any dangerous increase of temperature in his factory.

PRICE LIST.

Telethermometers (covered) for Refrigerators, Cold Storage Warehouses, Breweries, Packing Houses, and all damp or cold places. Indicating the temperature from 0° to 120° F. in intervals of one degree.....	\$125 00
Telethermometers (exposed) for Hot-Houses, Public Buildings, Drying Rooms, Cotton Mills, and all <i>dry</i> places where temperature changes rapidly. Indicating the temperature from 0° to 120° F. in intervals of one degree.....	130 00
Telethermometers for immersion in Liquids, Brine Tanks, and also for burying in the ground for obtaining continuous record of earth temperature. Indicating the temperature from 0° to 120° F. in intervals of one degree,	150 00
Telethermometers for High Temperature in Drying Ovens, Japanning and Vulcanizing Rooms, and all classes of manufactures where heat is used in process of manufacture. Indicating the temperature from 0° to 360° F. in intervals of three degrees.....	150 00

INSTALLATIONS OF TELETHERMOMETERS.

Installations of Telethermometers have been made in a great variety of industries, and the system is practically and successfully working to the satisfaction of all who have the instruments in use.

The following are a few of the places where the Telethermometer can be seen in operation.

EUGENE G. BLACKFORD, Fulton Market, N. Y. From fish freezers in his warehouses on Front Street to his office in Fulton Market.

WASHINGTON STREET COLD STORAGE WAREHOUSE Co., N. E. Hendrickson, Manager. From cold rooms containing Meats, Game, etc., to Manager's office.

INFIRMARY WARD, NEW YORK FOUNDLING ASYLUM, to the Physicians' Office.

HOUGHTON FARM, Mountainville, N. Y., H. E. Alvord, Manager. Earth Temperature, Hot-House and Open Air Temperatures to the manager's office, giving valuable data for agricultural and scientific research.

WEST PRESBYTERIAN CHURCH, 42d Street between 5th and 6th Avenues. Where four instruments from the main body of the church and galleries enable a uniform and desired temperature to be maintained by a person in charge of heating and ventilating apparatus. This installation shows the value of Telemetry in Public Building, Schools, etc., where temperature is an important consideration.

T. C. EASTMANN, West 59th, New York. Indicating in his office the temperature of chill rooms containing carcasses of dressed beef.

PROFESSOR DANIEL DRAPER, Director of Meteorological Observatory, Central Park, New York. Instruments indicating and recording the temperature.

S. HALSEY & SONS, Newark, N. J., Manufacturers of Patent Leather. Indicating and recording the temperature of Drying Ovens.

G. H. SHAFFER & Co., 107 Murray Street, New York City. Indicating and recording temperatures of rooms containing perishable merchandise, Meats, Oysters, etc.

UNITED STATES TREASURY DEPARTMENT, Washington, D. C., Bureau of Engraving and Printing. Indicating and recording the temperature of drying room.

GOODYEAR METALLIC RUBBER SHOE COMPANY. Temperature of vulcanizer.

BERGNER & ENGEL BREWING COMPANY, Philadelphia. Temperature of beer storage cellar indicated and recorded in the office of the Company.

And many others whose address can be obtained on application.

Industries requiring special applications furnished with full information and estimates.

THE TELEHYDROBAROMETER.

FOR INDICATING AND RECORDING HEIGHTS OF WATER AT A DISTANCE.

Indispensable to Water Power Companies, City Water Supply Companies, Mill Corporations, in Connection with River and Harbor Improvements, and in recording the Height and Movement of Tides, and of the Water in Rivers and Canals.

(Hewitt & Clarke's Patents.)

In all branches of hydraulic engineering, and in controlling and distributing the supply of water for any purpose, **the following are of paramount importance:** To accurately indicate in one central office the heights of the water at various places, to have the history of these heights indelibly written in a continuous record, and to sound an alarm when they reach certain determined limits.

The Telehydrobarometer accomplishes these results with accuracy and absolute reliability.

It operates automatically, and at the moment when a change takes place in the height of the water, thereby recording its fluctuations, and the time at which they occur.

WATER POWER COMPANIES.

To the engineer of a water power company, the Telehydrobarometers will indicate in his office the heights of water above and below the dam, in different parts of the distributing canals, and in the races and penstocks.

This information enables him to intelligently regulate the gates, so as to give to the consumers a proper distribution of the available water power, and is a check on the attention and faithfulness of his employees.

CITY WATER SUPPLY COMPANIES.

The Telehydrobarometers centralize in the superintendent's office the heights of water in storage ponds, reservoirs, standpipes and tanks.

The condition and control of the entire storage and distributing system are under his personal observation and **direction** day and night, and negligence and mistakes of employees in charge of the gate are at once detected and recorded.

MILL CORPORATIONS.

Mill corporations having the water power under their own control can know at all times the available amount at command, as well as the height of water at any locality.

The ringing of a bell gives notice of rise and fall of any determined amount, and **the height is continuously recorded.**

RIVERS, HARBORS AND CANALS.

In the improvement of rivers and harbors, to know accurately the heights of water and of tides, throughout the day, for all seasons, and in the entire district to be influenced by proposed improvements, is absolutely essential. **These data,** which enter into the determination of the nature and magnitude of the work, **are of the utmost importance** to the engineer.

The continuous record of the Telehydrobarometer is incomparably superior to the method of obtaining the record heretofore adopted, which consists in noting the height at stated intervals. This necessitates a corps of observers, liable to mistakes, whose record when obtained is only partial and often misleading.

To canal superintendents, the heights of the water in the different basins, levels and locks is always known in the office. **This information**, centralized as it is, **is an invaluable aid to canal navigation.**

OPINIONS OF AN EMINENT ENGINEER.

" HOLYOKE WATER POWER COMPANY,

" OFFICE OF THE HYDRAULIC ENGINEER,

" HOLYOKE, MASS., May 21st, 1885.

" TO THE TELEMETER COMPANY:

" GENTLEMEN—This company has set up a telemetric water gauge, to indicate and record in the office of the company the height of the water above its dam, the one point being about half a mile distant from the other.

" We have had the instrument in operation two months, and believe it may be relied upon constantly, to show on the office dial the indications of the transmitting index, moved by a float in the water.

" We are much pleased with the palpable value, now for the first time developed, of a continuous record of water heights in the river, where a record taken four times in the twenty-four hours, as formerly, was of comparatively little or no value.

" This company has shown its faith in the machine by ordering another, to indicate, in the office of the Superintendent of its Gas Works, the height of the gasometer bell at South Holyoke, one and one-half miles distant.

" Respectfully yours,

" CLEMENS HERSCHIEL,

" *Hydraulic Engineer of Holyoke Water Power Company.*"

DESCRIPTION OF INSTRUMENTS.

The Transmitter is the instrument located where the heights of the water are to be measured. The Receiver is located in the office, and indicates and records the heights of the water as measured by the Transmitter.

The transmitting mechanism is enclosed in a japanned iron case, with polished brass ring, dial ten inches in diameter, and is perfectly protected from dust and moisture. On the back of the case is a grooved brass pulley, which is revolved in one direction by a wire attached to a float, and in the opposite direction by means of a counter-shaft and weight. The pulley communicates its motion to the mechanism within the case for transmitting the height of the water to the Receiver. The whole is rigidly supported by a japanned iron frame, and is further protected by a glass case.

The indicating dial, for the fractional divisions, is nine and one-half inches, and the secondary dial, for the even feet, two and three-quarters inches in diameter. In the Receiver, the secondary dial carries the alarm hands for ringing a bell when the height of the water reaches any desired limit. The recording dial is fourteen inches in diameter, and the record made is distinct and indelible. Both instruments are thoroughly made of the best material and finished in a superior manner. The Transmitter and Receiver, which may be located any distance apart, are connected by three insulated wires, and are operated by a battery of prism Leclanché cells, placed in the office. This battery, in use in all telephone lines, requires no attention.

Two classes of instruments are made, indicating heights in feet and inches, or in feet and decimals of a foot.

The following is a table showing the total range of the Telehydrobarometer; the change in height of water corresponding to one

division on the dial (called Dial Division); the total range of record, and the scale of record in fractions of an inch per foot of water:

INDICATING AND RECORDING FEET AND DECIMALS.

NAME.	TOTAL RANGE.	DIAL DIVISION.	RANGE OF RECORD.	SCALE OF RECORD.
A-1	10 feet.	$\frac{25}{1000}$ feet.	10 feet.	$\frac{1}{2}$ inch to 1 foot.
A-1 $\frac{1}{2}$	10 "	$\frac{25}{1000}$ "	2 $\frac{1}{2}$ "	1 " " 1 "
A-2	20 "	$\frac{5}{100}$ "	20 "	$\frac{1}{4}$ " " 1 "
A-2 $\frac{1}{2}$	20 "	$\frac{5}{100}$ "	5 "	$\frac{1}{2}$ " " 1 "
A-3	40 "	$\frac{1}{10}$ "	40 "	$\frac{1}{8}$ " " 1 "
A-3 $\frac{1}{2}$	40 "	$\frac{1}{10}$ "	10 "	$\frac{1}{4}$ " " 1 "

RECORDING AND INDICATING IN FEET AND INCHES.

NAME.	TOTAL RANGE.	DIAL DIVISION.	RANGE OF RECORD.	SCALE OF RECORD.
B-1	16 feet.	$\frac{1}{2}$ inch.	16 feet.	$\frac{5}{16}$ inch to 1 foot.
B-1 $\frac{1}{2}$	16 "	$\frac{1}{2}$ "	4 "	$\frac{5}{8}$ " " 1 "
B-2	32 "	1 "	32 "	$\frac{5}{32}$ " " 1 "
B-2 $\frac{1}{2}$	32 "	1 "	8 "	$\frac{5}{16}$ " " 1 "
B-3	64 "	2 "	64 "	$\frac{5}{64}$ " " 1 "
B-3 $\frac{1}{2}$	4 "	2 "	16 "	$\frac{5}{32}$ " " 1 "

NOTE.—The indications and record of heights are accurate within two-thirds of one Dial Division.

The numbers 1 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ are recommended when a record with open scale is wanted. In these instruments, the recording pen can be shifted to a new base line when the record approaches the limit of the recording dial.

PRICE (F. O. B. IN NEW YORK CITY).

Including Transmitter and Receiver, with Recording Dial, Alarm Hands and Bell, Lightning Arrester, Grooved Pulley, Copper Float, Counter-Shaft and Weight, Glass Case for Transmitter, with Polished Black Walnut Frame and Base.....	\$350
Same as above, omitting Recording Dial	325

Each Instrument Fully Guaranteed.

Prices for instruments differing from tabulated list or for special work given on application.

TELEHYDROBAROMETERS FOR TANKS, range 60 feet in intervals of 6 inches.....\$140 00

INDEX.

Ammeters.....	55, 56	Microscope Lamp Holder.....	13
Ano Kato.....	104	Measurement of Light.....	48
BATTERIES:		Magnets.....	71, 72
" B " Battery	19	Motor, Sewing Machine.....	84
Constant.....	46	" Fan.....	23
Law	62	" Boy's.....	107
Leclanché	63	Magneto Bells.....	86
Roberts'.....	64	Medical Batteries.....	96
Permanganate	64	Porcelain Insulators.....	39, 40
Grenet.....	65	Push Buttons.....	77, 78, 79
Carbon	66	Reflectors.....	13
Bunsen.....	67	Resistance Coils.....	37, 52, 54
Grove	67	Rheostats	52, 54
Crow-Foot.....	67	Railway, Electric.....	103
Storage.....	68	Stands for Lamps.....	11, 12, 13
Medical.....	96	Sockets for Lamps.....	10, 11
Chemicals	70	Surgical Light Instrument	16
Pocket	106	Switches.....	37
Binding Posts.....	73	Sheehy Cut-out.....	38
Buttons, Push.....	77, 78	Standard of Light.....	48
Bells, Electric.....	77	Static Machine.....	57
" Magneto	86	Sounders, Giant.....	82
Binders, Wire.....	91	Storage Batteries.....	68
Criado Illuminator.....	16	Switches.....	75, 76
Cord, Flexible.....	opp. 36	Sewing Machine Motor.....	84
Cut-out, Arc Light	38	Show Stands.....	90
Carbons.....	70	Scarf Pins, Electric.....	106
Chemicals	70	Tape, Rubber.....	37
Connectors	73	" Edison.....	37
Coils, Induction.....	80	TESTING INSTRUMENTS:	
Dental Illuminator.....	16	Wirt Volt Indicators.....	44
Decorations, Electric Light.....	15	Wirt Constant Battery.....	46
Experimental Work.....	3	Ammeters	55, 56
Edison Lamps.....	7, 8, 9	Voltmeters	55, 56
Electric Fan	22	Standard of Light.....	48
Edison's Electric Light Standard,	48	Toepler Holtz Machine.....	57
Electro-Magnets.....	72	Telegraph Keys.....	81
Electric Toys.....	103	" Sounders.....	82
Fan, " Iceberg ".....	22	Thermostat Fire Alarm	87
" Blades	24	Turntables.....	89, 90
Flexible Wire.....	opp. 36	Thermometers.....	92
Flanges, Ceiling.....	37	Toys, Electric.....	103
Fibre, Vulcanized.....	69	Telemeters	108
Fire Alarm.....	87	Telemanometer.....	112
Gauges, Wire.....	74, 75	Telethermometer.....	114
Gas Lighters.....	83, 93, 94	Telehydrobarometer	118
Hard Rubber.....	69	Voltmeters.....	55, 56
Incandescent Lamps.....	7, 8, 9	Victor Telegraph Key	81
Insulated Wire.....	27	Vulcanized Fibre.....	69
Insulators, Porcelain.....	39, 40	Wiring.....	26
" Glass.....	42	Wire, Electric Light.....	27 to 31
Induction Coils.....	80	" Office	31
Keys, Telegraph.....	81	" Annunciator	31
" Signaling	80	" Magnet	32
Lamps.....	7, 8, 9	" German Silver.....	33
" Sockets for	10, 11	" " K.K. "	33
" Stands for.....	11, 12, 13	" Iron	34
" Mountings for.....	11, 12	" Weight of.....	35
" for Microscope.....	13, 14	" Fancy Flexible.....	opp. 36
" Surgical	16	" Platinum	69
Liberty, Statue of	105	" Gauges	74, 75
Manufacturing.....	3	" Binders.....	91

[BLANK PAGE]



CCA